Financial development in transition economies: A case study of Belarus

Korosteleva, Julia A.

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Financial Development in Transition Economies: A Case Study of Belarus

Julia A. Korosteleva

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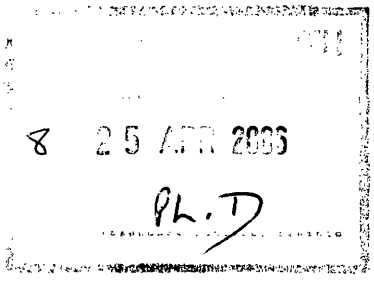
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Abstract

In the orthodox literature on financial development it is widely argued that liberalisation of the financial sector by abolishing interest rate ceilings, refraining from directed credit programmes and removing capital controls would lead to the deepening of the financial sector, and as a consequence, to economic growth. In the late 1980-90s post-socialist economies embarked on liberalising their financial sectors. Fast formation of competitive financial markets free of government intervention was intended to ensure successful transition from centrally planned system towards a market economy.

While most of the transition economies had made significant progress in liberalising their economies by the second half of the 1990s, the Belarusian authorities, anticipating the social and consequently political costs of economic liberalisation, abandoned this strategy and in 1996 reintroduced a pervasive state control over the economy, placing repression of the financial sector in the centre of the economic policy-making.

This thesis examines the financial development of Belarus in 1991-2002 within the financial repression paradigm based on the works of McKinnon (1973) and Shaw (1973). The case of Belarus is particularly intriguing because despite undertaking no transformation per se, and achieving no macroeconomic stability, Belarus has nevertheless demonstrated macroeconomic growth from 1997 onwards comparable to that in the Central European transition countries regarded as successful. By examining whether financial controls imposed on financial sector in Belarus in 1996-2000 facilitated financial deepening and analysing the consequences of the inflationary financing of enterprises for the Belarusian economy this study seeks to answer if Belarus' financial policy in the late 1990s can be regarded as efficient and the Belarusian alternative approach to transition can claim to be successful.

The study reveals that the Belarusian experience of financial repression had an overall negative effect on financial development, resulting in shallow finance and financial intermediaries playing a passive role in the development process over the period of investigation. The Belarusian financial policy has proven inefficient and unable to target long-run growth objectives.

Preface

Belarus is a small country and is not of much interest from the point of view of playing any major role in shaping the world political economy. It is not a naturally resource-rich country like, for example, Russia; its population is four times smaller than Ukraine's; its GDP makes only a minimal contribution to the total world economy; and it presents little strategic threat to the international community. Few ordinary people living in the West know about Belarus. Many view it as a part of Russia. Others recognise it only when it comes to the point of discussing the worst heritage of Soviet times – Chernobyl – or for its being governed by 'the last dictator of Europe' – Alexander Lukashenko. Yet interest in Belarus has grown recently among economists, puzzled by high rates of economic growth in a country that, unlike the majority of the former Soviet economies, did not follow the conventional transition path and hardly reformed the economy.

So, what inspired me to write about the Belarusian case of transition? The main inspiration came from my controversial feelings about the way 'transition' went in my country, and this personal experience led me to a desire to examine the process more objectively. The views expressed in the thesis support neither the orthodox approach to transition, at least the way in which it started and the way in which transition proceeded in many former Soviet Union countries (FSU), nor the political-cum-economic strategy pursued by the Belarusian government in the second half of the 1990s. My disagreement with the first stems from my family's first experience of the early years of transition and extends to the social costs it incurred across the region. In one day, my parents lost so much, starting from their savings, for which my father had worked hard all his life, which were eroded by hyperinflation. He dreamt of buying a car one day to travel around with his family. That day he could only afford to buy five ice creams. He lost more than money: he lost trust in the state and he lost hope for the future. All his life he used to work in a plant, and despite the fact that he was very talented in building construction and interior design, he could not start his own business in the time of transition. To do that it was necessary to have either capital or connections with the dominant political elite (nomenklatura). It was also difficult to find a job in this area, as nobody wanted to employ a man of middle age when a generation of young entrepreneurs with a new way of thinking was growing. No institutional infrastructure was created at that period to help people such as my father overcome these transitional problems. People were put second in this transition process. As Stiglitz (2002, p. 187)

contended, 'the Fund's [IMF] vision was too narrow – it focused only on the economics'. Not earlier than a decade after transition began the international advisers and policy-makers have started admitting their mistakes and anticipating that the transition from communism goes beyond privatisation, liberalization, and decentralisation; it requires a creation of markets and the institutional infrastructure (e.g. legal and regulatory frameworks, trade unions and social safety nets) (Stiglitz 2002). Although Belarus chose not to pursue the strategy advised by the IMF in the second half of the 1990s, its 'transition'[1] path could hardly be regarded as a better alternative, as in the end it will incur greater social costs than is currently anticipated. The Belarusian strategy turned out to be nothing more than an attempt to create some illusions of Wonderland, or of temporary prosperity against the background of a sharp fall in output and increase in poverty in the neighbouring Ukraine and Russia which had embarked on radical transformations of their economies. The Belarusian authorities failed to combine its short-term needs with long-term growth objectives. The present research unveils the inefficiency of Belarus' development strategy and shows that if transition had to be done in a different way it should not be pursued in the way in which it has been in Belarus, where in the end the Belarusian strategy of development aimed to serve the needs of a political elite, but not the needs of society.

I would like to thank a number of people for their help and support provided during the years of this research. Foremost amongst them are my mother, Dr. Tamara Korosteleva, who has always been an example of a great courage and purposefulness for me; my sister, Dr. Elena Korosteleva-Polglase, who encouraged me to embark on this challenging, but interesting journey of writing a thesis, provided with valuable advice through it, and who also helped me with obtaining a financial funding to assist this study at the early stage of the thesis; and my husband, Pavel Kuryan, without whose love, support and valuable comments this research would never become possible. My particular thanks are due to Dr Colin Lawson, my primary supervisor, who in the first place expressed an interest in doing research on Belarus, and who provided an invaluable advice and support in the course of this study. I am also very grateful to Dr Susan Johnson and Dr Andrew Abbott, my two other supervisors, for Susan's very valuable comments and ideas and Andrew's help and support in discovering the world of econometrics. My thanks go also to Dr Peter Dawson for providing me with helpful

[1] Here, inverted commas mean that the transition from communism to a market economy in Belarus has not begun yet as such.

advice on the use of econometric techniques in the earlier stage of my thesis. I also appreciate the assistance of Sergei Perapechka, Sergei Novik and Valentin Gavrilov, former and current officials of the National Bank of the Republic of Belarus in helping with obtaining the data for this research. My thanks go also to Giles Polglase and Dr Derek Hutcheson for proofreading some chapters of my thesis, and to Prof. Stephen White for his support during the final year of my thesis.

I would also like to acknowledge the financial support of Bath University that came in the form of a university research scholarship, and the UK Universities' ORS award.

This thesis is dedicated to the memory of my father, Alexander Korostelev, whom I infinitely and deeply love, and to all members of my family whose support was in particular invaluable.

Julia A. Korosteleva, January 2006

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List of Abbreviations

ADF	Augmented Dickey-Fuller Test
ADL	Autoregressive Distributed Lag Model
AIC	Akaike Information Criterion
AR	Autoregressive Model
ARDL	Autoregressive Distributed Lag Approach to Cointegration
BCSE	Belarusian Currency Stock Exchange
BET	Belarusian Economic Trends
Bln.	Billion
BRB	Belarusian Rouble
CB	Commercial banks
CEECs	Central & Eastern European countries
CM	Council of Ministers
CPE	Centrally Planned Economies
CPI	Consumer price index
DEV	The rate of devaluation of domestic currency
DGO	Long-term government liabilities
DP	Inflation rate
e.g.	For example
EBRD	European Bank for Reconstruction and Development
ECM	Error-Correction Model
Etc.	Et cetera
FCD	Foreign Currency Deposits
FL	Financial liberalisation
FR	Financial repression
FRI	A summary measure of financial repression
FSU	Former Soviet Union
FXC	Foreign exchange currency
GDP	Gross Domestic Product
GKO	Short-term government liabilities
GNP	Gross National Product
GR sq. Adj.	Adjusted GR square
H0	Null Hypothesis
IMF	International Monetary Fund
IPM	Institute of Privatisation and Management, Minsk, Belarus
IT	Inflation Tax
JSSB	Joint-Stock Savings Bank
LDC	Less developed countries
LFD	The natural logarithm of financial depth
LNM	The natural logarithm of real money balances (Mo)
LNYSA	The natural logarithm of the real GDP series per capita, seasonally adjusted
LY	The natural logarithm of the real GDP series per capita
MB	Monetary base
MCB	Minimum consumer budget
MEBOs	Management and Employee buy-outs
MICE	Minsk Interbank Currency Exchange
MISE	Moscow Interbank Stock Exchange
Mln.	Million

MSL	Minimum subsistence level
N/A	Not available
NBB	National Bank of Belarus
OLS	Ordinary Least Squares
p.a.	Per annum
p.m.	Per month
PAM	Partial Adjustment Model
R	The real deposit interest rate
R sq. Adj.	Adjusted R square
S	Seigniorage
SBC	Schwarz Bayesian Criterion
SF	System-forming banks
SMCBs	Small and medium-sized commercial banks
SU	Soviet Union
TACIS	Technical Assistance to the Commonwealth of Independent States
Test st.	Test statistic
TSLS	Two-stage Least Squares methodology
USD	United State Dollars
VAR	Vector Autoregressive Model
WB	World Bank

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Chapter 1 When Time Goes Backwards, or Explaining Financial Policy-making in Belarus: An Introduction

For more than a decade scholars have been discussing the issues of transition economies. For some of the Central and Eastern European (CEE) and Former Soviet Union (FSU) countries these issues are no longer topical and they have become history. However, in the majority of FSU economies, transition continues and a retrospective view of their economic development aids the explanation of why they have either succeeded, stalled or failed over the period and draw some imperative lessons for the future.

The present research examines the financial development of Belarus over the past decade with a particular focus on 1996-2000, when functioning of the financial sector was restrained through pervasive controls introduced by the government in the form of interest rate ceilings, directed credit and preferential loans schemes, high reserve requirements, multiple exchange rates policy and capital controls. The case of Belarus is of particular interest, as despite undertaking no economic restructuring the Belarusian economy has grown by 7 per cent on average since 1997.

While explanations of this 'miracle' abound[1], no empirical work has been undertaken on the role of the financial system in economic growth, particularly on the effects of pervasive government intervention in the financial system. Monetary stimulation of investment activity through low interest rates and directed credit and preferential loans schemes has been argued to contribute to the revival of growth in the late 1990s to a significant extent (Bakanova 2003 and Daneiko 2003). Thus, in the first place, the financial policy was expected to exert a positive impact on growth through financial deepening, increasing the share of savings to be allocated to investment, but has it proven to be so?

Chapter 1 starts from examining the political economy of transition to give an insight in what determined the choice of different transition pathways across the region. Section 1.2 provides an overview of the thesis and outlines the research questions that the present study seeks to address. The discussion of the methodological issues in section 1.3 follows the research's outline. The chapter concludes by looking at the contribution of this study to the debates on financial repression.

[1] See, for example, Pinigin 1999, Badei 1999, Usoskii 1999, Bakanova 2003 and Daneiko 2003 etc.

1.1 Political Economy of Transition

The fall of the Berlin Wall in late 1989 marked the beginning of transition of socialist countries to a market economy. The near simultaneity of regime changes often contributed to the perception that the former Soviet republics and the countries of Central and Eastern Europe by and large fit a common model of post-socialist transition, in which differences mainly lie in the degree or sequencing of market-oriented reforms. The reality of transition has proven more complex than it was viewed at the beginning. Policy sequencing and the degree of reforms seem not to be the only factors to explain why some transition economies succeeded and others failed. Country-specific factors, such as cultural and historical preconditions and institutional developments, in particular in political systems, have been recognised as playing no less a substantial role in defining the success of transition than the policy design.

To recall from history, since 1947 Europe was divided into two antagonistic blocs: on the one hand, the West with the USA at the helm, on the other hand - the East with the Soviet Union's lead. The aspirations of Yugoslavia to get rid of Soviet control and preserve its status of non-aligned state could have given impetus to the leaders of other communist states to follow its own way in building socialism. This forced the Soviet leadership to tighten political control over the satellite-states through the repressive measures of 1949-52. 'Political integration' in the Soviet block was accompanied by an economic integration. Created in 1949 the Council for Mutual Economic Assistance aimed to deepen an economic co-operation between the Soviet Union and its satellites by depriving them of economic independence. Thus, the radical change of the late 1980s in Central and Eastern Europe was as much a political ambition of these countries' new leaders as it was a rejection of state socialist ideology and a nationalist reaction to Soviet domination. Public participation and support in politico-economic restructuring was fundamental to the CEECs' achievements in carrying out reforms. An equally important factor was the aspiration of countries' leaders and people to join the European Union. On 16 December 1991 Poland, Hungary and Czechoslovakia, designated as the most advanced in their progress toward building democracy and market economies, signed the so-called Europe Agreements, thus becoming 'associated' with the EC. What united them was their geopolitical position in Central Europe, their eagerness to return 'back to Europe', in line with their 'complete

break with their communist past', through undergoing a fast economic restructuring (Lavigne 1999, pp. 99-100, p.119).

Belarus was different in making its radical choice after the dismantling of the USSR. Gaining independence in 1991 was not the result of a Belarusian societal protest against Soviet domination, and an aspiration for national self-identification. As such in pre-transition Belarus Belarusian national identity did not exist. It had been eroded by a policy of Belarus' russification starting from 1795, extermination of the Belarusian elite in the Stalin epoch, the Nazi occupation and, finally, by a second wave of Sovetisation taking place after the Second World War. Moreover, Belarusians like most of the nations of the Former Soviet Union, had little understanding of market economy values, as, unlike CEE countries, Soviet domination lasted for nearly seven decades, and the first major political and economic reforms did not start until 1986[2].

Thus the Belarusians were not ready for a political-cum-economic radical transformation of their society. Their first experience of transition was facing rocketing prices, which lead to the erosion of their savings and real incomes, and layoffs, all of which was happening against the background of enrichment of the dominant political elites, represented by the remnants of the Communist Party - the so-called nomenklatura. All this turned the majority of Belarusians into opponents of market reforms rather than its supporters, pushing them to elect the populist Lukashenko, who came as an outsider and whose election platform was focused on fighting corruption and Belarus-Russia unification. As Denizer et al. (1998, p.9) argues, 'reforms are more likely to occur when political outsiders challenge the authority of incumbents'. Indeed, the beginning of Lukashenko's presidency, 1994-1995, was marked by some fragmented market reforms, including domestic financial market liberalisation. However, the reforms were rather attributed to the liberal economic policy pursued by the government headed by Prime-Minister Chigyr and the sensible policy of Bogdankevich, a chief of the National Bank of Belarus in 1994-95.

Political oppression began in 1995, when Lukashenko's attempts to extend his presidential powers brought him into conflict with the parliament (Supreme Soviet) and Constitutional Court. Further, a referendum in November 1996 allowed the amendment of the constitution in terms of extending the presidential term and the replacement of the

[2] In 1986 the Soviet leader Mikhail S. Gorbachev launched the campaign known as Perestroika, involving political and economic restructuring of the Soviet Union, that allowed for more flexibility and freedom in decision-making.

parliament with a 'smaller and wholly subordinate National Assembly' that altogether 'paved the way for the establishment of an increasingly authoritarian regime' (White and Korosteleva-Polglase 2005, p.1).

In turn, economic policy was turned into the tool of assuring the political viability of the dominant political elite in the sense of avoiding some of the more direct negative social costs of transition. The introduced mechanism of a repressed economy gave an impression of continuity that was useful to the authorities (Korosteleva 2004). Thus administrative reallocation of resources and administrative interest rates control were supposed to maintain state-owned enterprises afloat and boost output through stimulation of aggregate demand. Timely wage payments, bans on layoffs and periodic increases in nominal wages were to target the social sector and, therefore, to assure Lukashenko's electoral support. Finally, creation of rent-seeking mechanisms through licensing of certain economic activities, rationing access to cheap natural resources, introduction of restrictions on foreign exchange and multiple exchange rates policy aimed at satisfying the interests of the political elite. Repression of the financial sector was placed in the centre of this economic policy to make financial intermediaries serve the government needs.

1.2 An Overview of the Study and Research Questions

The present research aims at analysing the effects of financial restraints on financial development in Belarus with their further implications for economic growth. Did financial controls imposed on the financial sector in Belarus in 1996-2000 lead to financial deepening? This is one of the main research questions that the present study seeks to address.

First, we provide a deep insight into Belarusian financial policy-making over the period of interest to see if the set of policies and controls introduced can be regarded as financial repression according to its classical definition.

Second, we estimate the impact of financial restraints on financial deepening with further inferences drawn for the Belarusian economic growth pattern of the late 1990s.

Third, recognising inflation tax as complementarity of financial repression regarding both as implicit forms of taxation of the financial system, we examine how Belarus benefited from inflationary financing of the economy. Since inflation tax is a

tax, there exists a point at which it is optimised under a certain rate of money growth - the revenue-maximizing rate. Then, the productivity of the tax can be analysed by comparing the actual revenue from inflation tax with the revenue that could be raised if the quantity of money had risen at a constant rate. An important implication of inflationary financing is that when prices rise in greater proportion than the quantity of money it results in real cash balances decline. In turn it results in finance shallowness with the consequent negative implications for economic growth. Can the monetary policy in Belarus in 1995-2000 be regarded as effective? What were the overall consequences of the inflationary financing of enterprises for the Belarusian economy? They are the two other questions that we are going to address in the thesis. The analysis of the effect of inflation on seignorage revenue helps us to draw conclusions on the effectiveness of monetary policy in Belarus in 1995-2002 and on the consequences of inflationary financing for the Belarusian economy.

The study concludes by setting the findings into a wider context. It is necessary to ask whether Belarus' financial policy can be regarded as efficient and the Belarusian approach to transition can claim to be successful.

The research proceeds along with two main strands of the literature, discussed in full detail in chapter 2. The first one goes back to the McKinnon and Shaw paradigm (1973), known as financial repression (FR). Following it FR can be defined as a set of policies and controls, primarily in a form of interest rate ceilings, requirements for banks to hold government bonds or finance government budget deficits, directed credit schemes to support 'selective' industries, high reserve requirements, and administratively regulated foreign exchange rates, imposed by governments on the financial sector, that restrain financial intermediaries' activities. The policies of FR are also accompanied by the introduction of capital control restrictions to prevent access by borrowers to foreign markets, as well as preventing domestic money holders from switching from savings in banks to purchases of foreign assets. The distortions from financial repression, particularly interest rate ceilings, discourage saving, reduce an average productivity of capital through the replacement of high-yielding with low-return investments which altogether hinder economic growth. Thus, raising interest rates to equilibrium levels and freeing foreign exchange rates, reducing reserve requirements, eliminating priority lending, or in general, introducing Financial Liberalization (FL), were regarded as a growth-enhancing policy. The latter gave rise to the conventional transition approach, advocated by the IMF and the World Bank, for economies in which

financial systems inherited from a planned economy were regarded as inefficient and restrained.

The second strand of literature addresses market imperfections in transition economies. Information asymmetries and problems of uncertainty typical of transition economies rendered emerging financial markets in many of them inefficient and prone to failure. Thus government intervention in the financial market through imposed financial controls was proposed to address market failures. Furthermore, 'optimal' financial repression was advocated to enhance economic growth through improving efficiency of capital allocation, by lowering the cost of capital and providing directed credits to enterprises with high technological potential (Stiglitz 1982, 1985, 1990, 1994).

The phenomenon of financial repression has been widely studied with application to developing counties, which were believed at times to pursue strategies resulting in 'shallow finance'. Chapter 3 provides an overview of empirical studies on financial repression. In their majority researchers conclude that financial repression exerts a negative effect on financial development and consequently on economic growth. However, in their studies of financial repression in India and South Korea Dematriades and Luintel (1996, 1997, 2001) conclude that different degrees of repression as well as cross-country institutional differences can lead to contrasting results - on the one hand, resulting in financial disintermediation in the case of India, and, on the other hand, positively affecting economic growth through addressing market failures in the case of South Korea.

Can FR theory be applied to study financial development in transition economies? This question is addressed in chapter 4. On the one hand, the issue of transition is more complex than simply the liberalisation of the financial sector, as it involves the transformation of the whole economy. Therefore, first, we review the role of financial systems under planning to identify how the legacies of a planned economy could shape the transition process. Second, financial development strategies in transition economies are examined to see if any commonalities can be found between transition economies and developing countries, to provide a justification for applying the McKinnon-Shaw framework to studying financial sectors in transition economies, and, in particular, to the case study of Belarus.

Chapter 5 presents the case study of financial repression in Belarus. First, it explains the rationale behind introducing a FR in Belarus. Second, it focuses on 1996-

2000, to see if that period can be dubbed as financial repression. Drawing on the implications of the policy of financial restraints we also hypothesise the effects it may have had on financial development in Belarus.

The latter are tested in chapters 6 and 7. To evaluate the effects of financial repression on financial deepening in chapter 6 we adapt the monobank model utilised by Demetriades and Luintel (1997) in their case study of India. The model is adjusted for special features of financial development in Belarus. The examination of the consequences of inflationary financing in Belarus in chapter 7 proceeds along with Cagan's (1956) seminal work on monetary dynamics of hyperinflation. The main research findings are summarised in chapter 8.

1.3 Methodology

1.3.1 Research Design

A range of various qualitative and quantitative techniques was used to undertake this research. A literature review led to the adoption of a theoretical framework, and the development and testing of hypotheses.

The literature review involved two stages. At the first stage, transition literature review, with a particular focus on financial sector restructuring was undertaken. This allowed familiarisation with the topical issues of transition in finance, and the identification of the main problems that transition economies encounter in the process of financial sector restructuring. The nature of transition in Belarus is the same as everywhere in the post-communist world. Therefore, in the second stage of the literature survey a theoretical framework was developed that focused primarily on an overview of the major theories of financial development over the past century, with the purpose of identifying the appropriate one to be used for transition economies. A review of empirical studies lets one formulate the main research questions.

At the third stage of research I started collecting the evidence that could help answer these research questions. It involved two field trips to Belarus in December-March 2002 and March 2003. The first field trip was a pilot study. It aimed to test whether the theory could be applicable to the case study of Belarus and to finalise the main ideas. This stage included collecting secondary data, primarily derived from local economic newspapers and journals, and from working papers/country reports of the

IMF, World Bank, EBRD and TACIS. After revealing some specific tendencies in the developments of the banking sector and financial markets of Belarus, I started testing them through a range of field interviews with people belonging to the bank elite (including both state-owned and commercial banks), high ranking officials (Ministry of Finance and National Bank of Belarus), parliamentarians, opposition parties' elite and the business elite. This allowed me to gather information on both official and alternative views. The questions were unstructured and the interviews provided an insight in the Belarusian economic policy-making, and on understanding of the rationales underlying official decisions. The data collected in the course of interviews was a mixture of qualitative and quantitative material.

Thereafter, I started collecting the primary data to provide the evidence supporting my hypotheses. The primary data were mainly collected during the second field trip to Minsk. They were primarily obtained from the National Bank of Belarus, the Ministry of Finance, the Ministry of Statistics, and Belarusian banks' statistics. Moreover, for drafting chapter 5 I relied not only on the National Bank data, that was very limited in terms of records held on financial restraints, but primarily on the data obtained from the Belarusian legal database 'Consul'tant Plyus'. It involved examining all letters and telegrams of the NBB, presidential decrees, and bank code etc, issued over the period from 1991 to 2002. Furthermore, some secondary data was obtained from the IMF (International Monetary Statistics), EBRD transition reports, Belarusian Economic Trends' statistics (TACIS) and, finally, the Research Centre of the Institute of Privatisation and Management (Minsk) were used to fill the gaps of missing primary data, to undertake a comparative analysis, or in the cases when we required to check the reliability of the primary data (discussed below).

At the final stage I processed the data by utilising various econometric and statistical software, such as Microfit 4.0, Eview 3.0 and SPSS 11.0. A range of time-series econometric techniques, starting from estimation of Two-Stage Least Squares technique and finishing with estimation of non-linear regressions, and undertaking of factor analysis, was used to draft chapters 6 and 7.

1.3.2 Data Limitations

It is very important to discuss some problems that we faced in undertaking the research. The first one is data availability, and the second one is data reliability.

The first is concerned with some monetary statistics on Belarus between 1991-1995, that are not available primarily because of the 'youth' of monetary statistics in Belarus and some specifics of the credit-monetary system before 1994 (discussed in chapter 5). The first official monetary survey was published in 1995. This explains why the sample for undertaking an analysis of the effects of FR policy starts from May 1995. Due to the absence of information on barter operations, I was not able to capture the problem of demonetisation of the economy while evaluating the effects of financial restraints on the financial development of Belarus (see chapter 6). Second, I experienced some difficulties in gathering the information regarding the use of directed credits schemes and interest rate ceilings. It appears to be confidential and therefore not accessible for public use. Some alternative methods were utilised in the thesis to overcome these limitations (discussed in chapter 5).

The major problem that I encountered was data reliability. To overcome the sample size constraints I had to use monthly data. The monthly GDP series, used in the present work, was provided by the Ministry of Statistics and Analysis (MSA) of Belarus. The data are compiled according to the System of National Accounts implemented in 1993. The aggregate GDP data are collected from the production accounts that lead to some statistical discrepancy between the aggregate GDP and its value obtained from expenditure flows. It is not common for any economies around the world to produce GDP series on a monthly basis, since it involves a laborious compiling process. Belarus might be the only country that produces GDP on a monthly basis. That is why it is reasonable to check how reliable the official monthly GDP data is. So, we perform an exercise aimed to check the reliability of the monthly GDP data, described in full details in appendix F.

Finally, chapters 6 and 7 provide detailed discussions of the methodology and data utilised in them.

In conclusion, it is important to stress the novelty of the research and its contribution to the literature on financial repression.

First of all, most of the existing empirical studies on the phenomenon of financial repression focus on developing countries and only a few are available with a reference to transition economies (e.g. Desai 1995, de Melo and Denizer 1997, Denizer et al. 1998). The latter are mainly cross-section studies (de Melo and Denizer 1997 and

Denizer et al. 1998)[3]. Furthermore, only de Melo and Denizer's work (1997) examines the relationship between the effectiveness[4] and market orientation of monetary policy in transition economies[5], while Desai (1995) and Denizer et al. (1998) focus on investigating the political economy of financial repression in the region. Therefore, the present research is the first time-series study that applies the financial repression framework to examining an impact of financial restraints on financial development in transition economies. The findings drawn on the basis of this study will contribute to the literature on financial repression by adding a case from transition countries.

Second, most of the studies on financial repression focus on the impact of interest rate controls on financial development more than other instruments. Although empirical evidence evaluating the effect of non-interest controls (e.g. reserve requirements and directed credits) exists (see Agarwala 1983; Brock 1989; Roubini and Sala-i-Martin 1992, 1995; Demetriades and Luintel 1996, 1997, 2001)[6]. The present research provides a comprehensive approach to studying the phenomenon of financial repression, which allows the impact of inflation tax (as an instrument complementing FR) to be embraced into the analysis along with interest and non-interest controls.

Third, it has been argued that inflationary financing and state stimulation of demand through the aforementioned financial repressionist policies contributed to the revival of the Belarusian economy in the late 1990s. However, no empirical evidence exists to support this argument. By analysing the effects of financial restraints on financial deepening the present research allows drawing some inferences for the role of the financial policy in the Belarusian economic growth pattern of the late 1990s.

Fourth, the data series utilised for the present research are treated comprehensively and uniquely. While examining data for stationarity along with the traditional Augmented Dickey-Fuller (ADF) test I have utilised some other not so widely used techniques (Perron 1989, Banerjee et al 1992 and Zivot and Andrews 1992)

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[3] They all focus on the early period of transition (1989-1995) that can be explained by the fact that some financial repressionist policies (in particular, interest rate controls and directed credits) were mostly present in transition economies at the beginning of transformation and in the pre-transition period, but in the second half of the 1990s the majority of transition economies made significant progress in liberalising their economies (see chapter 4).

[4] The effectiveness of monetary policy is proxied by financial depth and the inflation rate.

[5] It is measured as an annual country index for the Market Orientation of Monetary Policy Instruments which is computed on the basis of classifying transition economies by their market orientation in the use of direct (directed credit, credit ceilings and interest rate controls) and indirect (reserve requirements, refinance/discount facilities, government and central bank bills and bonds) monetary instruments (de Melo and Denizer 1997) For further discussion of their work see chapter 4.

[6] For further discussion see chapter 3.

that allow for structural breaks in series that are very typical of transition economies. None of the empirical studies on Belarus mentioned in chapter 7 utilise these techniques while testing for the presence of a unit root in series. However, the application of these techniques is very important, as it can lead to different results from those of the ADF test, and correspondingly can determine the use of different estimators.

Chapter 2 Literature Review of Financial Development: Theoretical Arguments

The proposition that financial development and economic growth have close relationships is widely accepted. Indeed, the perception of these relationships is usually such that the financial sector plays a crucial role in the growth process through allocating savings towards investment projects, and so increasing the rate of capital accumulation and altering the rate of technological innovation. Both are regarded as fundamental for long-term economic growth. Moreover, financial intermediaries contribute to economic development by performing other functions such as facilitating risk amelioration in the presence of the problems created by information and transaction frictions, monitoring managers and exerting corporate control, and, facilitating the exchange of goods and services[1].

Acknowledging this positive link between financial and economic development, the role of the financial system becomes central in transition economies moving from a planned economy to a market system. The issue of financial development particularly arrests our attention due to the fact that the financial system, which transition economies of the post-communist camp inherited from the planned economy, was significantly divergent from that in a market economy, and widely regarded as a one underdeveloped and inefficient in the orthodox literature. While the role of finance under a planned economy was rather passive, for finance served as a monetary counterpart of an enterprise's output and input, it is assumed to gain a 'new' growth-enhancing role in a market system.

In this regard before embarking on any analysis of the developments in the financial sector of transition economies it is very important to address the following questions: 'How important will be the role of financial markets in the economic growth process on the way from one mode of economic operation to another?' 'What are the vital elements of the 'new' financial system and what functions will it be performing?' 'What major changes will it be undergoing in a transitory period?' 'Will the 'scenario' of this transformation fit into any major concepts of financial development elaborated over the past century?' 'What potential problems can arise in the process of this transformation?'

[1] On the functional approach to understanding the finance-growth relationships see Levine (1997).

To answer these questions it will be imperative first to make a historical excursus in the far and recent past and overview some main dominant theories on financial development developed over the years.

Chapter 2 proceeds by, firstly, examining whether and how financial systems facilitate the process of economic development. Secondly, it provides a review of some prevailing theories of financial development with a view of their further application to examining financial restructuring in transition economies. In particular, we focus on the McKinnon-Shaw paradigm of financial repression, developed for examining financial systems in developing countries. Thirdly, we turn to the second major strand of literature, which challenges McKinnon and Shaw's theory, by addressing market imperfections in developing countries. Our main aim is to build an appropriate theoretical framework for analysing developments in financial sectors in transition economies based on these two major strands of literature.

2.1 Introductory Overview of the Main Theoretical Concepts of Financial Development and Economic Growth

The questions concerning financial development and economic growth are as old as they are new. There are continuous debates on the role of finance in economic development and the fact that financial systems have become more sophisticated and more essential in shaping the development of global capitalism. Historically, Schumpeter (1911) argued that the services provided by financial intermediaries promote technological change through financing the invention of new products or new production techniques, and as a result economic growth occurs. Hicks (1969) also believed that it was not technological innovation alone that ignited economic growth in eighteenth century England. According to Hicks some products had been invented much earlier – before they became mass-produced. Thus, it was large injections of investment that triggered the Industrial Revolution in England. Indeed, as Levine (1997) argues, high-return projects require large long-term investments that link together liquidity and economic development.

> '...If the financial system does not augment the liquidity of long-term investments, less investment is likely to occur in the high return projects....

> Because the industrial revolution required large commitments of capital for long periods, the industrial revolution may not have occurred without this liquidity transformation' (Levine (1997, p.692).

The literature on the finance-growth nexus is very controversial, and the main point of disagreement between economists is on the nature of causality. Two questions may be asked: 'Does finance matter for economic development?' and 'If it does what is the direction of causality in the finance-growth pattern?'

Many economists (e.g. Schumpeter 1911, Hicks 1959, Gurley and Shaw 1955, Gerschenkron 1962) saw financial development as a cause of economic growth. In turn, McKinnon[2] (1973) and Shaw (1973) particularly stressed an important role for a 'liberalised' financial system in economic development, arguing that interest rate ceilings, directed credit programmes, capital controls, altogether termed as 'financial repression', inhibit financial development and consequently growth (to be expanded below). Later, this argument became a mantra for the IMF and the World Bank, which have strongly advised a policy of financial liberalisation for developing countries. In turn, Tobin's neoclassical model[3] in terms of advocating the use of interest-rate ceilings, or loose monetary policy generating moderate inflation (by that setting an inflation tax) to stimulate the rate of economic growth, literally argued in favour of financial repression (see also Denizer et al. 1998, p.3). McKinnon (1973) and Shaw (1973) questioned the applicability of this approach to developing countries arguing that these distortions of the financial market 'crowd out high-yielding investments', create disincentives to save, and generally inhibit financial sector development. They developed their own concept of financial repression that we will be dealing with in the next section.

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[2] While McKinnon (1988) acknowledged the positive association between a higher rate of financial growth and economic growth, his concern about the direction of causation remained unresolved.

[3] Tobin's Portfolio Allocation model (1965), based on a typical aggregative nonmonetary model of economic development, aimed at linking together the financial sector and the real economy by introducing monetary assets into the model. He treats money as a durable asset meaning that economic units allocate their wealth between 'money' and 'productive capital'. Thus, in a Tobin type portfolio choice model, if the return on money falls compared to return on capital, households reallocate their wealth towards capital, increasing the ratio of capital to money in their portfolios. Sequentially, this raises the capital/labour ratio, raises labour productivity, and triggers higher economic growth. In turn, a reduction in the return on money can be achieved in two ways, namely by "the institutionally determined rate of interest on money" or in other words by reducing deposit rates of interest, or by increasing the growth rate of money stock leading to higher inflation.

Gurley and Shaw (1955) contend that finance and particular financial institutions are acknowledged as playing a crucial role in economic development. In their debt-intermediation model, they stress particularly an important role that accumulation of debt plays in the growth process. Besides self-financing (retained earnings) they also distinguish two other types of financing spending units with deficits budgets, namely direct and indirect financing. These are both external types of financing. Direct financing involves the issue of the instruments such as equities and bonds by deficit spending units. Indirect debt is comprised of loanable funds, and financial intermediaries are believed to play the central role in facilitating the flow of these funds between economic agents with a surplus of money and agents with a deficit, by borrowing loanable funds from units that were in surplus and issuing indirect securities in exchange. Gurley and Shaw (1955, p.518) note:

> 'Economic development is retarded if only self-finance and direct finance are accessible, if financial intermediaries do not evolve...Institutionalisation of saving and investment quickens the growth rate of debt relative to the growth rates of income and wealth'.

Opposed to viewing financial development as a cause of economic growth Robinson (1952, p.52) believes that it is economic development that generates demand for financial services noting, 'by and large, it seems to be the case that where enterprise leads, finance follows'. His approach to treating finance is what Patrick later termed as 'demand-following'. This view is supported by post-Keynesian economists (e.g. Lavoie 1984, Pollin 1991, Arestis and Chick 1995) who following the theory of endogenous money argue that money supply is both driven by bank lending and determined by the demand for bank loans. It implies that an expansion of production, or the behaviour of private economic agents determines the demand for credit, or in other words increases financial intermediation.

Other well-known economists are sceptical regarding the finance-growth relationship. Modigliani and Miller (1958) have an extremely polar view on the role of finance in economic development process - advocating the neutrality of money - better known as the neo-liberals' postulate 'Money does not matter'. Kuznets (1955) argues, '...financial markets begin to grow as the economy approaches the intermediate stage of the growth and develop once the economy becomes mature'. Lucas (1988, p.6) states

that the role of finance in economic growth is 'badly overstressed', while Chandavarkar (1992, p.134) says, '...none of the pioneers of development economics...even lists finance as a factor in development'[4].

Patrick's (1966) work on the causal nature of the relationships between financial development and growth in underdeveloped countries was the first that clearly addressed the difficulty of establishing the direction of causality between finance and growth, and made an attempt to summarise the previous discussions on this issue. Patrick dubs finance as, '...a demand-following and supply-leading phenomena'. By regarding finance as a demand-following phenomenon Patrick advocates that the, 'financial system somehow accommodates...growth of real per capita output' (1966, p.174). By that Patrick means that financial development occurs in response to the demand for financial services by enterprises. It implies the greater the growth, the greater will be the demand for external funds, or in other words for financial intermediation, since firms are unlikely to finance this expansion only from retained profits. In these considerations he sees the role of finance as passive in the development process. Moreover, Patrick asserts that the underdevelopment of some countries and their correspondingly ineffective growth patterns can be explained by an inadequate demand-following response by the financial system. Following the 'supply-leading' approach, finance may induce economic growth, but it does not imply that finance appears to be a precondition for 'self-sustained' economic growth. Patrick argues that the main function of 'supply-leading' finance is to reallocate resources from 'traditional (non-growth)' sectors to 'modern sectors' (growth-led) and in these considerations he finds a similarity between the role of 'supply-leading' finance and the role of finance within the Schumpeterian concept of innovation financing. Finally, he puts forward a hypothesis of 'supply-leading and demand-following finance' as follows:

> 'Before sustained modern industrial growth gets underway, supply-leading may be able to induce real innovation-type investment. As the process of real growth occurs, the supply-leading impetus gradually becomes less important, and the demand-following financial response becomes dominant'. (Patrick, 1966, p.177).

[4] For review of this literature see King and Levine 1993a, Levine 1997 and Luintel and Khan 1999.

Interest in finance-growth causality was revived in the late 1980s when longer lengths of pre-war and post-war datasets allowed further empirical study of this topic. Recent econometric studies have revealed very controversial results that do not in fact shed much light on the nature of causality. For example, King and Levine (1993b), presenting cross-country evidence consistent with Schumpeter's view that the financial system can promote economic growth conclude that 'Schumpeter might be right'. Further, Levine's (1997) findings based on cross-section study of 49 countries over the period of 1976-1993 strongly support a positive relationship between the functioning of the financial system and long-run economic growth. Although Levine agrees that the results obtained '...do not imply that finance is everywhere and always exogenous to economic growth', he still maintains the idea that 'financial systems are a fundamental feature of the process of economic development' (1997, p.690). In turn, the time-series study of Demetriades and Hussein (1996) for 16 countries[5] provides little support for the idea of finance causing economic growth, but rather they find greater evidence in favour of a bi-directional relationship[6] or reverse causation. Moreover, their findings reveal the limitations of cross-section country studies based on the assumption of countries' homogeneity, while in fact causality patterns vary across countries. The latter is supported by Arestis and Demetriades' study (1996) which argues that country specific factors such as institutional characteristics and financial sector policies are likely to influence the causal nature of finance-growth relationship[7].

2.2 The McKinnon-Shaw 'Financial Repression and Liberalisation' Paradigm

In 1973 the literature on financial development was enriched with the publication of two independent works by McKinnon and Shaw, focusing on the analysis of developing economies pursuing a 'financial repression' development strategy that results in 'shallow' finance. It was the first time that the concept of 'financial repression' (FR),

[5] The countries were selected based on a criterion of being not highly developed in 1960 following the World Bank definition, and having at least 27 continuous annual observations.
[6] For similar findings see Luintel and Khan 1999.
[7] A vast body of empirical literature on the relationship between financial development and economic growth has been published so far. It is not possible to cover all the studies in the present work. For further references see for example Demetriades and Andrianova (2003) and Levine and Zervos (1998). The literature on financial repression and economic growth will be examined separately as we proceed further.

better known as the 'McKinnon-Shaw' paradigm, was introduced. At the time the theory gained much attention and has since become widely used not only as a theoretical framework for studying financial sectors and their role in the economic growth process in developing economies, but also in the form of practical recommendations by the IMF and the World Bank to governments of less developed countries (LDC), urging them to liberalise their financial sectors.

Before proceeding, we should address the questions of, 'What is meant by the term 'financial repression'?' and, 'What are the implications of this policy?'

Following the McKinnon-Shaw framework 'financial repression' can be defined as a set of 'ill-conceived' policies and controls, primarily in the forms of interest rates ceilings, requirements for banks to hold government bonds and/or finance government budget deficits, directed credit schemes to support 'selective' industries, high reserve requirements, administratively regulated foreign exchange rates, imposed by governments on financial sector, that restrain financial intermediaries' activities. In turn, interest rates ceilings may lead to credit rationing by commercial banks due to the excess demand over supply in the market for loanable funds. The policies of FR are also accompanied by the introduction of capital control restrictions to prevent access by potential borrowers to foreign markets, as well as preventing domestic money holders from switching from savings in banks to purchases of foreign assets.

In general, FR and its instruments can be regarded as a form of taxation of the financial sector.

McKinnon and Shaw challenge a policy of financial repression, arguing that the distortions from financial repression, particularly interest rates ceilings, discourage saving, reduce the average productivity of capital through the replacement of high-yielding with low-return investments, and the creation of preference towards capital intensive projects, leading to negative an employment effect, all of which hinder economic growth. As Shaw (1973, p.5) notes, '...in all cases this strategy has stopped or gravely retarded the development process'. Consequently, they advocate abolishing distortions of 'financial prices' through raising interest rates to their equilibrium level and freeing foreign exchange rates, reducing reserve requirements, eliminating priority lending, or in general, introducing Financial Liberalization (FL) regarded as growth-enhancing policy.

Different reasons for the use of FR can be identified, starting from religious beliefs (e.g. the prohibition of 'riba'(usury) in Islam) and concluding with the political

motives behind it. Fry (1995, p.20) states, 'many developing countries appear to have slipped into financial repression inadvertently. The original policy was aimed not at indiscriminate repression but rather financial restriction'. Financial restriction measures were usually enacted to protect domestic institutions from competition from foreign companies, and as such were part of an, 'inward-oriented' development strategy. Indeed, maintaining interest rates below equilibrium level aimed to promote growth in selective industries through targeted lending. An overvalued exchange rate made imports relatively more expensive than domestically produced goods, to promote the latter in the market. Controls on capital prevented inward flows of foreign capital and ensured an increase in domestic investment (see Petrick, 1998).

In practice, financial repression often has fiscal implications. It implies that implicit forms of taxation, such as FR or higher rates of inflation can be used to offset growing budget deficits. Low interest rates provide cheap credit to governments to finance budget deficits. A policy of low interest rates usually goes together with the imposition of high reserve requirements on commercial banks and or requirements for banks to hold government bonds, or to lend money to government to finance budget deficits that all together provide cheap and sufficient credit to governments. Budget deficits can also be financed through higher rates of inflation. So far we have not touched upon the issue of inflationary financing, and why it should be considered in conjunction with the concept of FR. In fact, in the literature on financial repression, along with the concept of FR itself, important attention is drawn to the concepts of seigniorage (S) and inflation tax (IT). They are usually considered together with FR as its complementarities, although it is very hard to draw a clear distinction between defining IT and S either as instruments of FR or its complementarities. As Fry (1995, p.22) notes, 'typically, it seems, financial repression is the unintended consequence of low, fixed nominal interest rates combined with high and rising inflation'. We will deal with the concepts of seigniorage and inflation tax and their interrelation with FR in chapter 7.

Now, we will turn to more detailed examination of the McKinnon-Shaw model of financial repression and look at its implications. Figure 2.1 gives its graphical presentation.

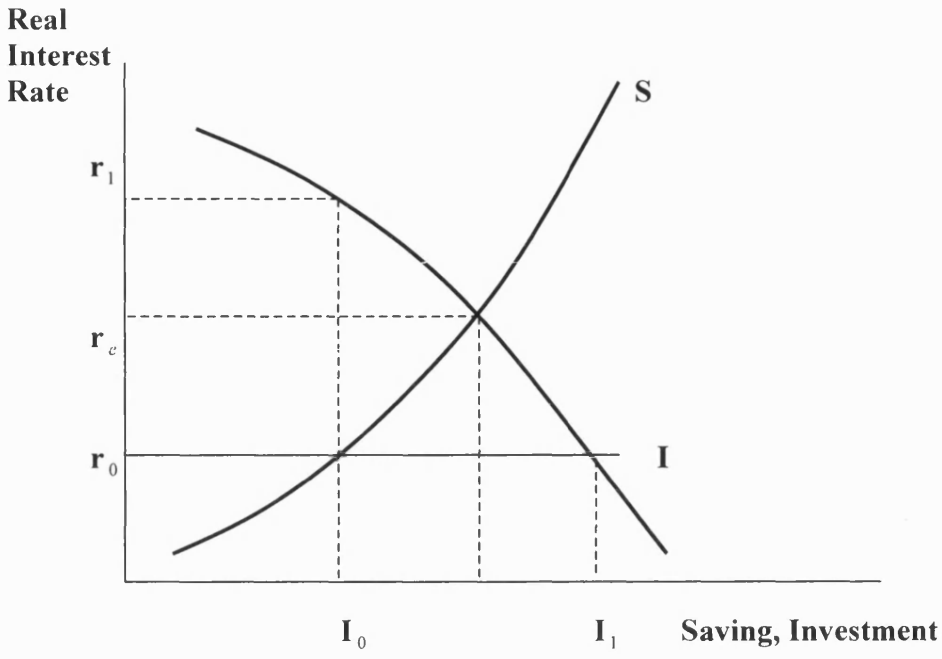

Figure 2.1: Saving and investment under interest rate ceilings within the McKinnon and Shaw framework[8]

where S - Saving function, at a rate of economic growth, y; S=f{y, r}, 'a positive function of the real interest rate' (see McKinnon 1973, p.67; Shaw 1973, p.73, 77-78).

r_0 - real interest rate consistent with administratively controlled level of nominal interest rate (fixed below equilibrium rate, r_e)

I – Investment function, I=f{r}

From figure 2.1 one can see that r_e is the 'financial price' at which the market for loanable funds clears, or in other words an equilibrium real interest rate where S=I. Assuming that the government sets a ceiling on the interest rate, we get a real interest rate, r_0, consistent with this administratively controlled level of nominal interest rate, lower then the equilibrium interest rate. The imposed interest rate ceiling will induce a fall in the level of saving, given a positive relationship between saving and the real interest rate, implying an excess (I_1-I_0) in demand for loanable funds over supply. In

[8] This figure is a modified version of the diagram derived in Fry (1995, p. 24).

fact, an excessive demand for loans means that only some investment projects can be financed. This can potentially lead to credit rationing unless an excess demand is not accommodated by authorities through monetary emission. The latter, by virtue of its inflationary nature, can even further jeopardise the situation and trigger an inflationary spiral.

If the interest rate ceiling is only applied to savers, but not borrowers, then borrowers still pay r_1 and the spread, $(r_1 - r_0)$, goes to the banking system. In this case it can hardly be regarded as a tax on the financial sector and can even have some positive effects on financial development as will be later shown in the example of South Korea. In fact, in most repressed economies both loan rate ceilings and deposit rate ceilings were usually applied, and the consequences of these distortions were detrimental.

With a loan rate ceiling imposed, financial institutions cannot charge a risk premium that makes them risk averse.

> 'This itself may ration out a large proportion of potentially high-yielding investments', and as a result reduce 'the average efficiency of investment' (Fry, 1995, p. 25).

Thus, abolishing interest rate ceilings (considered as a return to savers) will be an essential measure in increasing saving, and hence inducing a higher level and productivity of investment. In a broader sense, it means that financial liberalisation is a key to financial deepening, and as result enhance economic growth

McKinnon (1993) highlights the importance of fiscal discipline for successful liberalisation, noting that large government budget deficits are incompatible with financial liberalisation.

What is interesting to note about McKinnon-Shaw's model is the fact that we refer to it as a single paradigm, although two different approaches are used in constructing the model of financial development, and only on making some assumptions they can be regarded as complementing each other and be generalised in a single model.

McKinnon developed an outside money model in which the accumulation of large amounts of real money balances is necessary before self-financed investment can be effective.

Thus, the first distinctive feature of McKinnon's model is the fact that it is based on outside money assuming that economic agents cannot borrow to finance their investment spending decisions. It follows from the following two assumptions that McKinnon states:

- all economic units are confined to self-finance;
- indivisibilities exist in investment activities.

This means that potential investors must accumulate money balances prior to their investment (see Fry 1995, p. 27). In other words, the more attractive to hold real money balances - that is the higher the return on real money balances (real deposit rate of interest), the higher is the incentive to invest.

Therefore, he puts forward a hypothesis of complementarity[9] between money and productive capital that can be formulated as follows. Productive investment, and therefore capital accumulation, occurs because a large real money stock makes greater amounts of deposits available to economic agents.

The complementarity between money and productive capital can be traced from McKinnon's money demand function, expressed as:

$$\left(\frac{M}{P}\right) = f\left(\frac{I}{Y}, Y, d - \pi^e\right) \tag{2.1}$$

where $\left(\frac{M}{P}\right)$ - real money balances

$\frac{I}{Y}$ - ratio of investment to output

Y - real GDP

$d - \pi^e$ - real deposit rate (d is the nominal deposit rate and π^e is expected inflation)

Thus, the complementarity between money and physical capital implies that investment is a positive function of the return to physical capital and the return on real money balances (real deposit rate):

$$\frac{I}{Y} = f\left(\bar{r}, d - \pi^e\right), \tag{2.2}$$

where $\bar{r}$ - the average return on investment

[9] Fry (1978) tested McKinnon's hypothesis of complementarity for 10 Asian countries. His findings reject the complementarity between money and productive capital and suggest that higher money balances are likely to be held for consumption rather than investment. However, Vogel and Buzer (1976) find a strong complementary relationship in their study of Latin American countries.

Therefore, the complementarity can be expressed in the form of partial derivatives:

$$\frac{\partial\left(\frac{M}{P}\right)}{\partial\left(\frac{I}{Y}\right)} > 0; \quad \frac{\partial\left(\frac{I}{Y}\right)}{\partial\left(d-\pi^e\right)} > 0, \tag{2.3}$$

implying 'the higher the real deposit interest rate, the greater is the incentive to invest (see Fry 1995, p.27).

In turn, Shaw constructed a debt-intermediation model based on inside money, or in other words allowing for the accumulation of deposits to serve as an external source for financing a firm's investment projects. This reflects his pioneering joint work with Gurley (1955) on the role of financial intermediaries, through which firms are able to accumulate debt to finance investment, in accelerating economic growth. Shaw's money demand function can be summarised as follows.

$$\left(\frac{M}{P}\right) = f\left(Y, r, d-\pi^e, t\right) \tag{2.4}$$

where $\left(\frac{M}{P}\right)$ - real money balances

Y - real GDP

r - a vector of opportunity costs[10]

$d-\pi^e$ - real deposit rate (d is the nominal deposit rate and π^e is expected inflation)

t - time trend capturing a technological improvement in the monetary mechanism (see Shaw 1973, p. 62)[11].

According to Shaw, money demand is positively related to income, the rate of return on money (real deposit rate) and time trend. While regarding accumulation of money as one form of saving[12], he argues that the real return to money along with real yields on all other forms of wealth are positively associated with saving and financial deepening. Thus, 'growth in real monetary and other finance is associated with intermediation that unifies segmented capital markets and raises accessible rates of

[10] In his debt-intermediation view (DIV) Shaw assumes a variety of opportunity costs due to the segmentation of capital markets (see Shaw 1973, p.62).
[11] See also Fry 1995, p.29 for the model interpretation.
[12] Money is 'a substitute for saving through self-finance of physical investment, purchase of primary securities or acquisition of non-monetary indirect financial assets' (Shaw 1973, p.61).

return to wealth' (Shaw 1973, p.71) as opposed to the neo-classical proposition of the inverse relationship between money deepening and capital deepening.

After having compared both McKinnon's and Shaw's models one can clearly distinguish between them, and this has led to some disputes between economists about the compatibility of the models. Molho (1986) offers his interpretation of McKinnon's hypothesis of complementarity in a way that allows model compatibility. He argues that although in their approaches McKinnon and Shaw have different views of the capital accumulation process, - in the first case deposits encourage self-financed investment (borrowing constraints are assumed), while in the second case deposits accumulation is seen as a source of expansion of bank lending activities towards firms' investment projects, - they still 'complement each other because most projects are financed in part with own funds and in part with borrowings'. (see Molho 1986, p.111).

Indeed, in this regard both views seem complementary to each other, although it is still questionable whether Molho's interpretation can be accepted as McKinnon's own perception of complementarity (see Fry 1995, p.29). Anyway, both models imply a negative effect of financial repression on financial development in less developed countries, resulting in 'shallow' finance and therefore inhibiting economic growth. They both advocate a policy of financial liberalisation that can accelerate economic growth through increasing investment and its productivity.

Their policy recommendations gain much support from the empirical study of financial reforms in Taiwan (early 1950s) and Korea (mid-1960s) (see Fry 1995, p.23). The more recent empirical literature on financial repression (Roubini and Sala-i-Martin 1992, 1995, Giovannini and De Melo 1993, Fry 1995, Demetriades and Luintel 2001) in the main concludes that FR has a negative impact on economic welfare and also advocates financial liberalisation. However, the financial repression literature also encounters a great deal of criticism (see Stiglitz and Weiss 1981, Diaz-Alejandro 1985, Stiglitz 2000 and Demetriades and Luintel 2001) recently raised due to the experience of some unsuccessful liberalization episodes in Latin America, Asia and Russia (see chapter 3 for the review of empirical literature on financial repression). The next section provides a discussion of some critical views built upon the McKinnon-Shaw financial repression paradigm.

2.3 Critics of the Theory of Financial Liberalisation

2.3.1 Overview of the Main Theoretical Views Opposed to the McKinnon-Shaw Paradigm

As financial liberalization has spread further in emerging economies, it has given rise to much criticism. Traditionally, there can be distinguished different schools within both the orthodox and heterodox economics, and also some well-known individuals criticizing the theory of Financial Liberalization on a variety of grounds.

In the early 1980s the neostructuralist school (Taylor 1983 and Buffie 1984) advocated negative effects of financial liberalization as opposed to the effects described by McKinnon and Shaw. Their criticism is based on the assumptions of the price level's determination by fixed markups over costs of factors of production (including capital costs, i.e. the interest rate) and the high dependence of developing countries on the import of raw materials and capital equipment. They argue that a rise in interest rates will push the costs of production up. Moreover, they continue that a consequent devaluation[13] will make imports more expensive that will increase the costs further inhibiting economic growth. Their major contribution to the criticism of the McKinnon –Shaw school is in highlighting the important role of noninstitutional finance or curb market[14] finance that is absent in the McKinnon-Shaw model. They treat curb market loans and banks loans as complementarity, and thus allow the former to enter the money demand function as an alternative to holding money. Moreover, they find curb markets more efficient in intermediating between savers and investors compared to banks. In their models it is the demand and supply of loanable funds in noninstitutional markets that determine the price of capital, i.e. the interest rate (see Fry 1995, pp.109- 111).

Among the other critics Fry (1995) distinguishes the following groups.

The first one is represented by Kalecki (1971) and by Akyüz (1991) who argue that higher interest rates will lead to a sectoral redistribution of saving in favour of householders. This may induce a fall in corporate saving, to the extent exceeding the rise in households saving and in the end resulting in a fall in investment and consequently in the rate of economic growth. A second group (see, for example, Jappelli

[13] As a matter of fact, in an open economy higher real interest rates lead to an appreciation of the real exchange rate, implying a deterioration of export position of a country.
[14] Curb market denotes unofficial financial market

and Pagano 1994) notes that financial liberalization will relax the access of households to consumer credit and offer high returns on a variety of financial assets that can divert households' funds from saving and decrease the overall saving ratio. Others provide similar argumentation as the neostructuralists advocating that higher borrowing costs increase production costs, lower real wages and reduce aggregate demand (see for example, Arestis and Demetriades 1993)[15].

What is interesting to note is the fact that despite financial liberalization encompassing a set of measures, the central emphasis in the policy prescriptions of financial liberalization was placed on freeing interest rates to allow them to be determined through market forces. The rationale behind this was the proposition of market clearing and the assumption of equilibrium to be achieved in the market for loanable funds, in the absence of interest rate ceilings. Meanwhile, a problem of uncertainty (due to asymmetric information) typical of less developed countries appears to be a potential obstacle preventing markets from clearing. Allowing for the assumption of the presence of asymmetric information in markets, doubts the proposition of market clearing and questions the FL theory that abolishing interest rate ceilings will be necessarily positive.

The following section discusses the literature that criticizes FL theory on the above grounds and on the basis of the argument of market failures prevailing in financial markets.

2.3.2 The Literature on Information Asymmetries, Uncertainty and Incentives

2.3.2.1 Introducing the Problem of 'Adverse Selection'

This literature goes back to Akerlof's study (1970) 'The market for lemons', which though not directly related to financial markets, has some important implications for all markets. In fact, Akerlof's work laid the basis for the literature addressing a problem of imperfect information and uncertainty, and the first highlighted a problem of 'adverse selection' (to be expanded on below).

[15] For a more detailed review of this literature see Fry (1995 pp. 109-131). For a review of Post-Keynesian Critique of Financial Liberalisation see Petrick (1998).

His model is constructed using on the automobile market as an example, and distinguishing between good cars and bad cars. The latter are called as 'lemons'. He argues that there is an asymmetry in information, with the sellers, having a better knowledge of product quality, tending to misrepresent the information to the buyers and sell bad cars for the price of good cars. In turn, the buyers have their own perceptions of average product quality, and thus the price that they are willing to pay undervalues 'good' cars and overvalues 'bad' cars. Thus, sellers of low-quality goods ('bad' cars) gain a 'premium price at the expense of the sellers of high-quality goods ('good' cars)' (see Petrick 1998, p.29). As a result the sellers of good-quality products tend to leave the market, not willing to be paid such a low price. It leads to the fall in a market price as the buyers formulate new perceptions of the average quality of product with regard what is left in the market. The sellers of 'bad' cars continue to crowd out the sellers of 'good' cars from the market until the price will drop to such extent that only low-quality sellers stay in the market. This was dubbed as a problem of 'adverse selection'.

Akerlof emphasised that this problem is particularly typical of underdeveloped countries where uncertainty is present and the variation in quality of products is on average greater than in developed countries. He stresses, 'Credit markets in underdeveloped countries often strongly reflect the operation of the Lemons Principles' (1970 p. 497).

The implication for financial markets of the Akerlof's theory can be summarised as follows. In a situation of uncertainty when lenders do not have full information about the riskiness of borrowers' projects it is difficult for them to distinguish between 'low risk' borrowers and 'high risk' borrowers. In turn, borrowers have an incentive to present to lenders information on investment projects they are planning to undertake in the best possible light, even if they (borrowers) expect a high probability of default on a loan. In fact, it can potentially lead to the problem of 'adverse selection' described in Akerlof's study. Literally, it implies that 'low-risk' borrowers along with 'high-risk' borrowers will be incurring higher borrowing costs due to the 'risk premium' added on top of the interest rate, which could have been the one regarded as a true market price if there were perfect information in the market. Not willing to overpay, 'low-risk' borrowers will gradually withdraw from the market. 'High-risk' borrowers will continue bidding for loans pushing the 'risk premium' up. Literally, it will imply higher risks for lenders, as the probability of default increases.

(Demetriades and Andrianova 2003, p.12). They get involved in speculative lending and operations with securities, being tempted by very high interest rates promising large profits and quick returns. If borrowers happen to default, banks do not incur the full costs in this case, providing they are bailed out by the government. If banks do fail, depositors may avoid losses if they are protected by deposit insurance. If this is the case depositors have no incentive to monitor banks, although it is fair to note that they are also lack information with which to monitor banks. Bank shareholders may not have any incentive to monitor bank managers either, because they do not have much to lose providing they own little capital that is at stake. As Demetriades and Andrianova (2003 p.12, derived from Llewellyn 1999) argue, 'bank shareholders may even benefit from gambling behaviour by the managers, if they have little capital at stake...In such circumstances it may be in their interests to instruct banks managers to gamble (with taxpayer's money) – this is sometimes known as 'gambling for resurrection'.

As a possible solution for smoothing the effects of information imperfections Stiglitz advocates government intervention. Stiglitz (1994, p.20) believes that, 'there exist forms of government intervention that will not only make these markets function better but will also improve the performance of the economy'. However, it is not always that government intervention can be efficient in addressing market failures. As Stiglitz (1994, p.32) notes, 'some interventions motivated by, say, pressures from special interest groups actually impede the functioning of markets and redirect the allocation of capital in ways that cannot easily be related to any correction of a market failure'. That is why it is very important to ensure the creation of the 'right' and properly working market institutions in the first place. Proceeding further, Stiglitz (1994, pp.39-42) argues that generally financial repression can improve efficiency of capital allocation through lowering the cost of capital that will increase firms equity and providing directed credits to enterprises with high technological potential.

Fry (1997) expresses his disagreement with Stiglitz's arguments on the following grounds. He says that lower interest rates will not necessarily lead to greater capital efficiency because firms with lower-yielding projects are likely to bid for loans. Moreover, the marginal cost of capital may even increase because the capital rationing problem that is likely to occur may trigger borrowers to turn to curb markets where the estimated cost of capital will be higher. Arestis and Demetriades (1997, p.796) conclude, 'market failure does not necessarily imply government success'.

This question of government intervention versus free markets continues to raise many debates among economists. It is not an easy issue to deal with. We will get back to it in the next chapter, where examination of episodes of financial repression in developing countries will help us shed some light on the effect of government intervention in financial sector functioning.

In summary, before embarking on any analysis of developments in financial sectors of transition economies, it is very important to elaborate a theoretical framework within which we can proceed with our analysis.

What is particularly intriguing about transition economies is that they have undertaken economic transformation from a planned economy, where finance played a passive role, to a market economy, where financial sectors are believed to play growth-enhancing role. Therefore, it places the financial sector in the centre of the transition process, assuming its crucial role in inducing growth in transition economies through capital accumulation and rising productivity of investment.

The literature review on financial development and finance-growth nexus in chapter 2 has identified 'financial repression' theory, better known as the 'McKinnon-Shaw' paradigm', that can be used as a core theoretical framework for analysing developments in financial sectors in transition economies.

Developed in the mid of 1970s, it has since become widely used not only as a theoretical framework for studying financial sectors in developing economies, but also in the form of practical recommendations by the IMF and the World Bank to governments of less developed countries and later to transition economies, urging them to liberalise their financial sectors. Indeed, as it will be developed further in chapter 4, the policies suggested to transition economies by the experts of the IMF and the World Bank, stem from the conventional view that the financial system inherited from the planned economy was inefficient and restrained.

The financial repression literature also encounters a great deal of criticism, raised particularly recently due to the experience of some unsuccessful liberalisation episodes in Latin America, Asia and Russia. Most of the failures were attributed to the presence of information asymmetries and uncertainty in financial markets, bringing to the surface a problem of adverse selection and moral hazard. The latter became typical of many less developed countries and transition economies as they proceeded with financial liberalisation. Therefore, it is also important, when analysing developments in

financial sectors of transition economies within 'McKinnon-Shaw' framework to address these problems.

The next chapter will present us with an overview of empirical studies on financial repression, suggesting some mixed results of the impact of financial repression on financial development and economic growth.

Chapter 3: Empirical Studies on Financial Repression

It is widely argued that countries with better developed financial systems, namely with a denser banking system, and more active securities markets, grow faster than those where financial sectors are inhibited. As outlined in chapter 2, in the 1970s the mainstream economic literature on financial development regarded the financial systems of less developed countries as financially repressed.

Typically, interest rate ceilings, selective credit schemes and high reserve requirements were common instruments of Financial Repression across many developing countries. A majority of researchers studying a FR phenomenon conclude that financial restraints have a rather negative impact on financial deepening and economic growth. It is widely argued that liberalisation of the financial sector by abolishing interest rate ceilings, refraining from directed credit programmes and removing capital controls would lead to the deepening of the financial sector, and as a consequence, to economic growth. In the late 1970-80s many developing countries embarked on liberalising their economies, including financial sectors. Later, this 'financial liberalisation' panacea spread to transition economies. Recommended by the IMF and the World Bank to the Eastern European countries and the Former Soviet Union, it was intended to ensure a successful transition from centrally planned system towards a market economy.

Financial Liberalisation Theory has ignited a lot of controversial debates. Case studies of less developed countries (see sections 3.2 and 4.3) show that after attempts to undertake financial liberalisation, some countries faced detrimental consequences of FL, and reintroduced some elements of financial control. A reasonable question is to ask why some countries managed to succeed whereas others failed. Although it is a topic for further research, our study of FR would be incomplete if we did not touch upon this issue. By studying the experience of developing countries in terms of FR and their first attempts of reforming financial sectors it is possible to identify what went wrong in developing countries and what could be the 'optimum' way of liberalising economies. Should this be gradual with a steady withdrawal of government intervention preserving some partial financial control over years of reform until the necessary institutions are established and the development process is on its right track - free from the influence of the rent-seeking groups or political lobbies? Or should it be rather rapid, leading to a

'large destruction of the old order before economic resources can be efficiently redeployed' (McKinnon 1993), as happened in majority of socialist transition economies in the late 1980s and early 1990s? One can argue that perhaps the 'optimum' way as such does not exist since every country is unique and there is no way that 'one size can fit all'. However, it is also true that individual experience can be less costly if one learns from the mistakes of others. Indeed, some valuable lessons for transition economies can be drawn from the experience of developing countries in their attempts to move from financial repression to reforming financial sectors.

The present chapter is organised as follows. Section 3.1 presents an overview of the empirical literature examining the financial repression paradigm. Section 3.2 focuses more on recent empirical studies where such issues as information asymmetries leading to market failures are taken into account, and some consequences of financial liberalisation in developing countries are sketched.

3.1 Consequences of Financial Repression: Facing the Evidence

The phenomenon of financial repression has been widely studied with application to developing countries, which were believed at times to pursue development strategies resulting in 'shallow finance'.

As a result of the failure of the traditional nineteenth-century orthodox approach foreseeing free trade in both domestic and foreign markets, and a later growth of the Keynesian approach emphasising the need for official intervention in the aftermath of the Great Depression, a policy of pervasive government intervention in domestic economies became widespread in less-developed countries (LDCs) after World War II. Moreover, evidence of success of the above policy in centrally planned economies of Central and Eastern Europe and the Soviet Union, demonstrating impressive economic growth in the 1950-1960s, appeared as more proof for governments in LDCs in favour of the strategy of strengthening state control over domestic economies in the form of introduced price controls, policies inhibiting development of financial markets, protectionism in foreign trade and pervasive subsidies in domestic trade (see McKinnon 1993)[1].

[1] In fact, some of the developing countries such as Nicaragua in 1980s and India in 1970-80s were under great political influence from the Soviet Union. During this period the mode of operation of their economies bears close resemblance to a planned economy of a Soviet type.

Drawing on examples of financially-repressed countries in Latin America and in parts of Asia, distortions in financial markets appeared in the form of interest rate ceilings, quite often resulting in negative or low positive real interest rates; directed credit subsidies; and high reserve requirements. Directed credit subsidies were usually selective, targeting (as a rule) loss-making state-owned industrial or agricultural enterprises and being channelled through bank agencies at much lower than equilibrium interest rates. Even with the rate of inflation often far exceeding the nominal interest rate these directed credits could be treated as a gift. The consequences of directed credit subsidies policy quite often were detrimental. Thus, for example, credit expansion towards agriculture in Nicaragua from 1980 to 1991 triggered an inflation spiral and the consequent devaluation of the Cordoba made agricultural debts, denominated in national currency, virtually costless. The later attempts to index debts failed, leading to pervasive nonrepayment. As McKinnon (1993, p. 46) argues, 'moral hazard in bank lending had become so pronounced that farmers treated credit as a welfare payment rather than as a commercial transaction'.

According to Fry (1995, p.5) the proportion of domestic credit to central governments averaged 52.6 per cent in 91 developing countries over the period 1978-1987 compared to only 18.1 per cent in the 19 industrial countries. Proceeding further, official reserve requirements across financially-repressed countries were very high, for example, averaging over 30 per cent in Latin America countries versus less than 10 per cent in industrial countries in 1971-80[2]. By regarding banks' reserves as part of the monetary base and therefore as a base for inflation tax these high rates of reserve requirements in Latin America ensured 4-5 times higher gains from seigniorage compared to the industrial countries (see McKinnon 1993, p.56). Altogether financial restraints with high inflation were believed to reduce the attractiveness of domestic monetary assets leading to a gradual demonetisation of the economy and replacement of domestic monetary assets with 'socially costly' inflation hedges. With real yields on deposits becoming negative under high and unstable inflation, enterprises preferred to accumulate inventories that resulted in the fall of the average efficiency of investment.

Since financial systems in developing countries are dominated by commercial banks, in most cases the imposition of financial restraints on financial sectors outlined above became possible by nationalising the banking sector and limiting the

[2] Here, Latin America encompasses Chile, Uruguay, Mexico, Columbia and Brazil, whereas the United States, West Germany and United Kingdom represent industrial countries.

independence of central banks in these countries by making them subordinate to governments. This was typically the case in India, Latin America and South Korea (see section 3.2).

As mentioned in chapter 2, in practice, financial repression often has fiscal implications, meaning that governments' failure to satisfy the budget constraint with conventional tax revenue can be offset by introducing implicit tax in a form of FR. The evidence suggests that the revenue from FR can be substantial. Giovannini and De Melo (1993, p.959) show that the unweighted cross–country average of government revenue from financial repression accounts for 9 per cent of government revenue. Their estimates suggest that the revenue varies significantly across different developing countries. While it is close to zero in Indonesia, it reaches nearly 3 per cent in India, and 6 per cent in Mexico, where it accounts for as much as 40 per cent of Mexican government revenue. The revenue gained by the government from inflation tax Fry (1993, p.11) shows that for a sample of 26 developing countries on average in 1984 it amounted to 2.8 per cent, and that, in turn, represented over 17 per cent of the governments' current revenue.

An enormous literature exists on FR and its effects on financial development (selectively discussed below). As mentioned in chapter 2 most researchers argue about the negative effect of FR on financial development and consequently on economic growth.

One of the earliest studies estimating the effect of financial repression is Lanyj and Saracoglu (1983). Their cross-section study covers a sample of 21 developing countries for the period 1971-80. They divide them into three groups depending on a scale of real interest rates, giving a value of 1 to countries with positive interest rates, a value of 0 to countries with moderately negative real interest rates and finally a value of –1 to countries with substantially negative real interest rate. Lanyj and Saracoglu found a positive and statistically significant relationship between the interest rate dummy variable and the rates of economic growth, suggesting that negative real interest rates rather inhibit economic growth.

Drawing upon an IMF study of interest-rate policies in developing countries in 1974-85 and on a similar nature, Gelb's (1989) work on developing countries over the 1965-85 period, McKinnon (1993, p.18) concludes that real positive rates of interest are positively associated with output. A World Bank (1989, pp.30-32) study, based on Lanyj and Saracoglu's methodology, suggest similar results: countries with severely

negative real interest rates (below 10 per cent on average over the period 1974-85) had experienced lower economic growth compared to those with positive real interest rates. This conclusion is also supported by Fry's findings from several pooled time-series and cross-country studies for Asian economies for the 1960s and 1970s, implying that 'a one percentage point increase in the real deposit rate of interest towards its competitive free-market equilibrium level is associated with a rise in the rate of economic growth of about one half a percentage point' (Fry 1988, p.152). At the same time, the World Bank's (1989, p.32) and Gelb's (1989, p.20) estimates of the coefficient of economic growth with regard to real interest rate for developing countries suggest that it ranges between 0.2-0.26.

All these studies focus only on interest rate policies and the way they affect economic development, while other instruments of FR seem to be neglected. Indeed, in analyses of the impact of FR on financial development and economic growth the majority of studies are focused on the impact of interest rate ceilings. This goes back to McKinnon and Shaw (1973) who placed the main focus on deposit rate ceiling as one of the main instrument of FR with further extension to the first generation financial repression models (Kapur 1976, Mathieson 1980 and Galbis 1977). Fry (1995) concludes that a deposit interest rate fixed by the government below its market equilibrium level is placed in the centre of first generation studies of financial repression, and he notes that regarding the competitive free-market equilibrium deposit rate as the growth-maximizing rate is what these models have in common.

Empirical evidence providing evaluation of the effect of reserve requirements, directed credit schemes and inflation tax, as an instrument complementing FR, is not as vast, although it exists (see Agarwala 1983; Roubini and Sala-i-Martin 1992, 1995; Demetriades and Luintel 1996, 1997, 2001; Brock 1989). They either studied an impact of individual financial repression policies on financial development/economic growth or their joint impact through a summary index of financial repression.

Thus, Roubini and Sala-i-Martin (1992) while expanding the Barro (1991) regression by introducing a number of measures of the financial repression found that relationship between financial repression and economic growth appeared to be statistically significant and negative. Moreover, they discovered that the dummy variable introduced in the original Barro regression for Latin America to capture an impact of unobserved variable on economic growth and being significant, loses its

statistical significance when a financial repression variable[3] is introduced into the regression, suggesting that a higher degree of financial repression can be the reason behind the lower rates of economic growth in Latin America. Moreover, they found that only a strong degree of financial repression (when real interest rates were less than minus 5 per cent) was associated with significantly lower economic growth (around 1.1 per cent of per capita growth per year) (Roubini and Sala-i-Martin 1992, p.25). Finally, their theoretical model also suggests that countries with higher degree of financial repression will witness higher rates of inflation. Their findings imply that a 10 per cent inflation rate per year is associated with lower per capita growth rate of 0.5 per cent per year. Rousseau and Wachel's (2002) study of inflation effects on growth covering 84 countries over the 1960-1995 period shows that financial deepening stops accelerating economic growth when inflation exceeds the 13 to 25 per cent threshold.

In their later study Roubini and Sala-i-Martin (1995) claim that negative correlation between inflation and economic growth is spurious, as both of them are caused by financial repression policies. In formulating this argument they depart from the proposition that the financial sector is the source of easy resources for the public budget. Therefore, in countries with inefficient tax systems, governments are more likely to resort to financial repression policies in order to gain this public income. They model this income as inflation tax (IT), regarding interest rate ceilings and high reserve requirements as part of the overall IT and seigniorage (Roubini and Sala-i-Martin 1995, p.277; for studies of the similar nature also see Brock 1989 and de Gregorio 1992). They argue further that it is financial repression that triggers increases in real money demand[4] and, therefore, higher rates of inflation as a consequence of monetary growth. In turn, higher inflation causes a reduction in savings, aggregate investment and economic growth.

[3] This result was robust when particularly the two measures of financial repression were used one at a time: a dummy variable used as a proxy to capture restrictions on interest rates (derived on a basis of Agarwala's study (1983) to be expanded in chapter 6) and a composite index of distortions in financial markets (also derived from Agarwala (1983) as weighted average of different distortion measures). However, when reserve ratio was used as a measure of financial repression, although it appeared to significant in explaining economic growth, but not sufficient to drive away the regional dummy.

[4] In their work money demand is a positive function of consumption and a negative function of nominal interest rate (opportunity cost) and of the level of financial development of the economy for all levels of interest rate. Financial development lowers the transaction costs of transforming non-liquid into liquid assets and, therefore, the more developed financial economies, the lower marginal benefit of holding money. At macroeconomic level it means that savings are rather allocated to more efficiency units of physical capital in financially developed economies (see Roubini and Sala-i-Martin 1995).

Demetriades and Luintel (1996, 1997, 2001) found that financial repression (proxied by the composite index of various financial repression policies) had effects on financial depth that were additional to those of real interest rate (see section 3.3 for a detailed description of their studies).

Proceeding further, it will be instructive to look at some studies considering the transmission channels of the effect of financial repression (primarily through the real interest rate) on economic growth. There were identified two main channels through which these effects occur. While the early studies (see Kapur 1976 and Mathieson 1980) showed that the effect of repressed financial conditions on economic growth mainly occurred through the reduction in the level of savings and correspondingly in the quantity of investment in the economy, the later empirical studies (primarily, endogenous growth literature) presented the evidence of FR having its major impact through reducing the quality of investment (deteriorating the productivity of investment) (see, for example, King and Levine 1993a, Roubini and Sala-i-Martin 1992, and Gelb 1989).

Thus, Gelb (1989), while analysing growth rates across thirty-four countries, investigated whether economic growth occurs due to increased amount of investment available to the economy (measured by the ratio of investment (aggregate saving) to GDP, or due to higher productivity of this investment, measured by the incremental output-capital ratio. His findings suggest that the efficiency effect exceeded the investment effect by four times, meaning that higher positive interest rates mainly influenced economic growth through increased investment efficiency rather than through increased investment (see McKinnon 1993, p.22). A World Bank study (1989, pp.30-32) also shows that the investment ratio in countries with positive real interest rates had been only 17 per cent higher than in countries with negative real interest rates, whereas the average capital efficiency (measured by incremental capital/output ratio) in the former four times had exceeded that in the latter. Therefore, as Fry (1997, p.762) suggests, 'financial repression exerts its main impact on the quality rather than quantity of investment'.

An increase in transactions costs was named among other ways through which financial undevelopment may effect economic growth (see, for example, Roubini and Sala-i-Martin 1992 and Blackburn and Hung 1998). In financially developed economies financial intermediaries perform the monitoring task that removes the costly necessity for each investor to monitor the project. In turn, it reduces transaction costs and allows a

larger share of savings to be allocated to investments. Examining the transmission channels of financial development on economic growth in transition economies Koivu (2002) finds that financial development accelerates economic growth mainly through reduction in bank margins and a decrease in the proportion of non-performing loans (denotes the quality of information in a baking sector) - both regarded as qualitative measures of financial development. In turn, lower margins (consequently transaction costs) increase the share of savings allocated to investment, although she fails then to find any significant relationship between the size of banking sector measured by the volume of loans allocated to private enterprises and economic growth. It can suggest financial policies exert their effect rather on productivity of investment. Oddly, perhaps, but there appears to be an inverse relationship between bank credit to private sector and growth. Koivu speculates that it well may be that the quality of credit stock is negatively related to its size. Indeed, her sample covers the period 1993-2000, when many transition economies, particularly of the FSU region, continued allocating bank loans to inefficient 'priority' sectors of the economy'.[5] Evaluating an impact of financial depth on growth in transition economies of Southeast Europe Mehl and Winkler (2003) also fail to find any significant effect. They attribute it to the failure of the reforms of the first half of the 1990s to prevent inflationary finance and financial crises in the countries of this region that ultimately contributed to large output losses (see chapter 4).

Finally, it should be noted that high reserve requirements decrease the fraction of savings going to investment, as they increase the spread between lending and borrowing rates. (Fry 1995) Bencivenga and Smith (1992) argue that governments in developing countries resort to financial repression (in particular, high reserve requirements and interest rate ceilings) in order to gain from inflation tax. In countries where the government deficit is large, governments are more likely to monetise a deficit. Therefore, to increase the gains from inflation tax they 'engage' in financial repression by this 'augmenting' demand for money. As Bencivenga and Smith (1992, p. 767) put it '...developing countries face a trade-off in the use of reserve requirements and interest rate ceiling: output losses from the use of such instruments must be weighted against benefits derived from more efficient use of the inflation tax'. Thus their study addresses the question of the 'optimal extent of financial repression' in a

[5] A typical feature of transition economies is that distinction between 'private' and 'public' was often blurred, as many public enterprises although were turned into joint-stock companies, but state ownership was dominant in them; other (usually large) state enterprises or state directly became the main owners of these 'privatised' companies (for a discussion see chapter 5).

developing economy forced to rely on the inflation tax for financing a sustained deficit. The authors' model takes the form of a general equilibrium model in which liquidity provision by banks determines output and inflation. They embed the Diamond-Dybvig model (1983) of intermediation in an overlapping generations model with production, capital accumulation, and outside money; a monetised government deficit is also introduced[6]. Their model also provides some sort of reconciliation between the McKinnon-Shaw and 'new structuralist' views (see chapter 2). Recalling the latter, it was argued that financial liberalisation of the sort advised by McKinnon and Shaw draws resources from the informal sector to an organised banking system. However, to the extent that the latter is 'subject to reserve requirements not present in the informal sector, and to the extent that the funds absorbed by these requirements are not used to finance investment, this may result in no increase in capital formation, and no expansionary effects on output' (Bencivenga and Smith (1992, p.237). Indeed, Bencivenga and Smith find evidence supporting this argument. Nevertheless, they contend that financial liberalisation is still 'welfare improving, as the intermediated sector provides superior risk sharing' (ibid).

In summary, 'repressionist' policies in the financial sector have an overall negative effect on financial development as well as inhibit economic growth mainly through deceasing the average productivity of capital. As many empirical studies suggest countries with a higher degree of liberalisation in financial markets, when maintaining higher real interest rates on bank deposits and loans, demonstrate greater financial growth than those that are heavily financially repressed.

3.2 Discussing the Rationale for Government Intervention

It would be too premature, based on the main findings from the empirical works reviewed in the previous section, to stop our discussion at this point, concluding that financial restraints unequivocally hamper financial development and advocate financial liberalisation as an alternative policy to promote financial development and economic growth.

It is imperative to recall some recent time-series studies by Demetriades and Luintel (1996, 1997, 2001) estimating an impact of financial repression in India and

[6] For technical details of the model see Bencivenga and Smith (1992).

South Korea on financial development and economic growth in these countries. These works are particularly interesting because, first of all, Demetriades and Lunitel consider the implications of financial restraints in an imperfectly competitive banking industry, and secondly, they come up with contrasting findings, for the first time suggesting that the effects of financial repression can be mixed.

In their examination of the Indian and South Korean experience of FR they find that in the first case FR had a strong negative impact on financial development, while in the second case financial restraints are found to have a large positive effect on financial development.

Both countries exercised all the variety of financial restraints described above. India introduced control over its financial sector in the early 1960s in the form of lending rate ceilings, directed credits and concessionary lending rates for 'strategic' enterprises, and followed this with nationalisation of the banking sector in 1969 and 1980. It started gradually liberalising its financial market only in the late 1980s. The South Korean banking sector control also took place in the early 1960s through the nationalisation of the banking sector. The South Korean experience of financial repression is particularly intriguing as it coincided with the period of rapid economic growth in this country[7].

Basing on the works of Courakis (1984) and Stiglitz (1994), Demetriades and Luintel (1996, 2001) hypothesize that financial restraints may have effects on financial development not only through the interest rate effect as per conventional McKinnon and Shaw theory, but also depending on a market structure. They assume the presence of imperfect information, and consequently imperfectly competitive behaviour in banking in developing countries. Thus they contend that in many developing countries the banking industry is dominated by a small number of banks and collusive behaviour is not uncommon. Indeed, 'asymmetric information in loan markets is in fact sufficient to generate some degree of market power for lenders who would then be able to act as if they where monopolists in relation to the pool of potential borrowers that are attached to them through long-term bank-customer relations' (Demetriades and Luintel 2001, p. 463. See also Stiglitz 1994). Thus, Demetriades and Luintel, put forward an argument about the inverse relationship between the degree of state control over the banking system and the ability of the banking system to operate as a profit-maximizing cartel.

[7] For more details on developments in the financial sector in India see Demetriades and Luintel (1996, 1997), and on the South Korean case of financial repression see Demetriades and Luintel (2001).

Consequently, they assume that this relationship implies a positive association of the degree of state control in the form of a lending rate ceiling, with a level of financial development. Thus, providing time-series evidence from South Korea, Demetriades and Luintel find that mild repression of loan rates, with a lending rate ceiling (i_1) above the competitive market rate (i_c), but below the monopolistic profit-maximizing rate, increases the volume of loans and deposits. At the same time they find that if severe repression takes place, meaning that the lending rate ceiling (i_2) is lower than the competitive market rate, then it will lead to a negative impact of interest rate ceilings on financial development as their evidence suggests in the Indian case. The above can be presented as a monobank model (see figure 3.1).

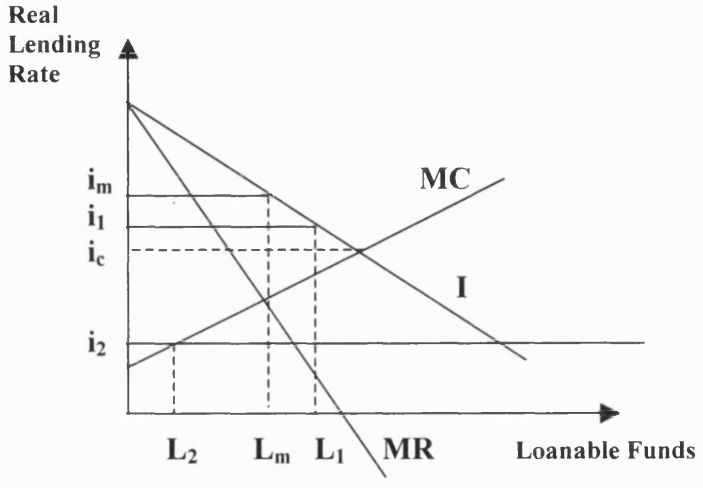

Figure 3.1: The monobank model: lending rate ceiling[8]

To conclude, the above evidence suggests that FR policy does not necessarily have negative effects on financial development, as McKinnon and Shaw suggest. Different degree of the severity of repression as well as institutional differences in the structure of the banking sector varying from country to country can lead to contrasting results as it has been just seen on examples of India and South Korea. As Demetriades and Luintel (1997, p. 318) conclude, positive effects of financial repression in the last instance can be attributed to the success of addressing market failure.

[8] The figure is adapted from Demetriades and Luintel (2001, p.464) Note: i_m is a lending interest rate at which the monobank maximises profit. Lm is a volume of loans granted at this interest rate. L_1 and L_2 are volumes of loans granted at i_1 and i_2 interest rates (for their description see text above). MC stands for marginal costs. D denotes demand curve and MR is marginal revenue.

Next, we will look at some interesting results obtained by De Gregorio and Guidotti (1995). They hypothesised that the relationship between economic growth and real interest rate has inverted U –shape form. According to them,

> 'Very low (and negative) real interest rates tend to cause financial disintermediation and hence tend to reduce growth, as implied by McKinnon-Shaw hypothesis...On the other hand, very high real interest rates that do not reflect improved efficiency of investment, but rather a lack of credibility of economic policy or various forms of country risk, are likely to result in a lower level of investment as well as a concentration in excessively risky projects' (De Gregorio and Guidotti 1995, pp. 437).

Later, Fry (1997, p.755-770), after undertaking a pooled time-series analysis regressing the annual rate of economic growth against the real rate of interest for 85 developing countries for the period 1971-95, obtained the results supporting De Gregorio and Guidotti's argument. Indeed, the studied relationships have an inverted U-shape form. He also found that 'growth is maximised when the real interest rate lies within the normal or non-pathological range of, say, -5 to +15 per cent' (Fry 1997, p.764). Fry extended his empirical study to estimating a simultaneous-equation system trying to identify how financial conditions, in part excessively high interest rates at the outset of financial liberalisation in some developing countries, affected saving and investment ratios, and export and output growth rates[9]. He concluded that excessively high interest rates had just as devastating an impact as financial repression (see Fry 1997, p.765). A problem of unjustified high interest rates jeopardises in the presence of information asymmetries that is typically the case of developing countries, and as a result may lead to excessively risky lending strategies and an increase in bad debts[10]. In other words, this exacerbates a problem of 'moral hazard and gambling behaviour in the banking system, thereby increasing the riskiness of banks' portfolios...and the probability of financial crises' (see Arestis et al 2002, p.111). In the next chapter, we will demonstrate a practical implication of the above finding while considering an experience of socialist transition economies in reforming their financial sectors.

[9] In this exercise Fry use the data from 16 developing countries, namely Argentina, Brazil, Chile, Egypt, India, Indonesia, Korea, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Sri Lanka, Thailand, Turkey and Venezuela, for the period 1970-88. The value of real interest rate in this sample ranges from –83 per cent to 221 per cent (Fry 1997, p.765-767).

[10] See, for example, McKinnon and Pill (1997).

Meantime, it is interesting to note that some empirical evidence of implementing financial liberalisation policy in many developing countries starting from the 1970s reveal quite controversial outcomes from what was predicted by the financial repression literature. Real interest rates soared to unprecedented levels, exacerbating moral hazard problems. Excessive risk lending became widespread and speculation flourished. As Demetriades and Andrianova (2003, p.11) note, 'instead of better, more developed, financial system there were failed banks that had to be rescued by the government'. 'Good-bye financial repression, hello financial crash' is how Diaz-Alejandro (1985) briefly summarizes the Latin American experiments with financial liberalisation since the mid 1970s. According to him, financial reforms, 'aimed to ending financial repression', led to massive bankruptcies, sharp falls in domestic savings, and by 1983 the reintroduction of pervasive government control or massive nationalisations of private institutions (Diaz-Alejandro 1985, p.1). Indeed, Chile's experience of financial liberalisation, started from the privatisation of most banks in the mid 1970s, followed by the removal of interest rates ceilings and the relaxation of restrictions over convertibility and capital movements in the early 1980s. It finished with pervasive government rescue operations of banks and the exertion of government supervision and control over them in 1983 to prevent a further breakdown of the financial system. Following the official estimates, non-performing banking assets increased from 11 per cent of their capital and reserves at the end of 1980 to 113 per cent in May 1983 (Arellano 1983, p.192, quoted in Diaz-Alejandro 1985, p.11). Typical scenarios of financial liberalisation in Latin America (LA) were liberalisation of domestic banking markets with real interest rates soaring (on average over 30 per cent in LA) and causing an 'overborrowing syndrome'. High government debt-to GNP ratios were not unusual among Latin American countries creating a large threat of debt crisis. As McKinnon (1993, p.6) notes, 'in many LDCs, people now anticipate that the government will default on its domestic bonds-as in March 1990 with Brazilian government's freeze of 80 per cent of its outstanding liabilities in the hands of Brazilian firms and households'. This undermined government credibility made non-inflationary domestic deficit financing impossible, pushing authorities to switch to monetary emission, the consequences of which were an inflationary spiral.

While analysing what went wrong, many economists agree on incorrect sequencing of reforms and some adverse preconditions such as large fiscal deficits and high inflation (see, for example, McKinnon (1993), Villanueva and Mirakhor (1990)

and Fry (1997). Thus, McKinnon argues that fiscal control in part of balancing government budget and phasing out quasi-budget operations, as well as price stabilisation and hardening of enterprise budget constraints should precede FL. Only where these conditions are met, can governments consider the further opening up of capital markets to international markets. Otherwise, the premature elimination of exchange controls on foreign capital flows can lead to detrimental conditions, causing unprecedented capital inflows and risky increases in foreign indebtedness. There is no need to rush and it is better to ensure gradual withdrawal of interventionist policies to avoid a financial crash. Finally, as Fry (1997, p.768) concludes, 'Unless the government is committed to fiscal reform in conjunction with financial liberalisation, financial repression may be the lesser of two evils'.

In summary, in the present chapter the key empirical studies on financial repression were reviewed. The majority of researchers studying the FR phenomenon agree that financial restraints have a negative impact on financial deepening and inhibit economic growth, mainly through deceasing the average productivity of capital. As many empirical studies suggest, countries with a higher degree of liberalisation in financial markets, when maintaining higher real interest rates on bank deposits and loans, demonstrate greater financial growth than those, that are heavily financially repressed.

At the same time more recent evidence from several time-series studies suggests that the effect of financial repression may depend on market structure, policy sequencing and institutional environment. For example, financial restraints imposed on a financial sector with an imperfectly competitive banking industry can lead to mixed results much depending on the severity of the financial repression.

The presence of information asymmetries in developing countries and transition economies is also likely to affect the results of reforms in financial sectors in their attempts to end financial repression. If moral hazard and adverse selection problems exacerbate, anticipated outcomes of 'financial liberalisation' policy, dubbed as paving the way to financial deepening and economic prosperity, could be easily reversed and spillover into a financial crash and the reintroduction of state control over the economy. Unless the right preconditions for financial reform are created, 'financial repression may be the lesser of two evils'.

Admitting the fact that the empirical studies presented in this chapter focus rather on developing countries, it is necessary to justify using the 'McKinnon-Shaw'

framework to analyse the financial policies of previously socialist economies. This issue is addressed in the next chapter through reviewing financial policies in transition economies and identifying the commonalities that can exist between developing countries and transition economies in their experience of financial development.

Chapter 4 Challenging Transition: Financial Sector Restructuring

The present chapter examines financial sector restructuring in transition economies in the context of both the conventional transition approach and the path-dependency approach. The latter identifies the legacies inherited from the Soviet economy and the ways they can shape a transition process.

Section 4.1 examines the distinctive features of the operation of finance in a centrally planned economy. This is required to realise the nature and scale of the ongoing transformation in the financial sector, to define the possible legacies inherited from the past and their influence on transition process. On the whole, transition economies inherited an underdeveloped financial system from a planned economy with money and institution vacuum, and ineffective credit system being its main legacies creating potential constraints for financial restructuring.

Section 4.2 reviews the initial shocks which all transition economies faced at the beginning of transformation, and, based on the response to these shocks and the progress of liberalising their economies, draws the patterns of transition. Section 4.3 looks closely at the process of bank reform and the creation of financial markets. The chapter concludes with a summary of the similarities of financial policy-making in both transition economies and developing countries, which seeks to justify the use of the financial repression framework for examining the case study of Belarus.

4.1 Money and Credit under a Planned Economy

Opposed to the market economy a coordination mechanism in a centrally planned system was based on the central plan, the core of which was the drafting of 'material balances' (Lavigne 1999)[1]. Material balances or production targets were specified in physical units identifying sources of supply and uses for individual products or products groups (sectors of the economy). Along with the central production plan authorities determined a financial plan specifying financial targets which served as the monetary counterparts of enterprise's output and input and thus that provided the planner control

[1] A balance identified sources of supply and uses for certain products or products groups. By the 1960s the Soviet economy had become more complex and diversified leading to an increase in the amount of planned items that made it increasingly difficult to control plan implementation (Lavigne 1999, p. 11).

over enterprise operations. In accordance with the financial plan[2], to support the production plan enterprises were allocated financial resources through accessing their endowments ('own funds'), redistribution of surplus[3] in the form of state subsidies and credit supply to finance gaps in funds. This money did not go into the sphere of open monetary exchange but worked as non-cash clearance between enterprises. Here we define one of the distinctive features of a planned economy - that is a separation of money supply into two circuits[4]. Private[5] or cash money which was used between the household sector and the state sector including both government and state-owned enterprises. Enterprise or non-cash money was used in settling transactions between enterprises themselves and partly between enterprises and government. Both private and enterprise money were not interchangeable with the latter being exchange for currency exclusively through payroll withdrawals. The rationale behind separation of money flows was to avoid excess demand (Garvy 1977, p.76). Therefore, money played a different role than in an economy that depended on a money circuit. While money was passive in a production circuit and as an instrument of monetary policy, it still remained active in the private sector despite its restrictive function performance (see below).

Payments to households were in the form of wages from state-owned enterprises and transfer payments from the government. In turn the purchase of consumer goods by households, payment of taxes, or deposits in the state savings bank were the way of returning currency issued to households in a form of payroll withdrawals, to the state sector. Private money had similar characteristics to those of money in a market economy, that is it served as a store of value, a medium of exchange and a unit of account, at least concerning monetary relations between individual persons and the state sector. At the same time ownership of money did not give an absolute command over resources, as individuals were still bound to purchase only consumer goods, the type, supply and price of which were determined by the planning authorities (Petrick 1998, p. 49).[6]

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[2] The financial plan was comprised of the credit and the investment plans.

[3] Surpluses were usually accumulated in large industrial enterprises and were transferred to the budget with a purpose of further reallocation of these resources among enterprises running a deficit as well as direct government expenditures (De Melo et al 1997).

[4] See, for example, Garvy 1977 and Zwass 1979.

[5] This definition is used by Zwass (1979, p. 9) to denote household money. Garvy (1977, p.76) defines this money as 'currency money' and uses term 'deposit money' to denote enterprise money.

[6] There were a few other flows of private money. Also included in the cash circuit are payments within the household sector. In truth, in some countries farming and some small enterprises were kept in private ownership as well. Households engaged in farming or in small business could also use private money to

As stated above enterprise (deposit) money was used to settle all the transactions between state units, i.e. both between enterprises, and enterprises and the state. According to Garvy (1977, p.38) this money existed as a unit of account and was viewed by many Soviet monetary economists, who denied the monetary nature of deposits, as a clearing fund. The deposits of enterprises were not freely usable and were controlled through branch ministries. The managers (directors) of enterprises could not independently dispose the retained profits. Therefore, meeting a production target was almost the only 'incentive' for an enterprise to run a surplus. In the late 1970-90s a deficit was common enough. For any surplus money, aside from a set amount retained as a 'development fund' within the enterprise for financing its capital investment, was either taken back into the state budget or reallocated to enterprises with a deficit (Petrick 1998, p. 50)[7]. Credit supply to enterprises, also treated as 'planning funding', along with the state subsidies (enterprises' surpluses) served to finance the gaps in funding enterprises' fixed and working assets to ensure their economic activity. While in a market system credit is assumed to stimulate economic activity as it provides the means for the development of enterprises' activity under conditions of competition - for example through use of market interest rate – a mechanism of effective allocation of funds, - in a planned economy it mostly had a long-term negative effect, taking into account the centralised mode of resource allocation with the resulting 'soft budget constraint'[8].

The banking system in a centrally planned economy was primarily represented by the Monobank or Gosbank as it was defined in the Former Soviet Union, which was state-owned and operated as both a central bank and monopoly commercial bank. The Monobank was designed to serve only enterprises while providing them with short-term loans for working capital needs. Since one of the main Monobank functions was to

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buy capital goods (means of production) from the state. In addition, some transactions between enterprises could consist of cash payments. However this took place within carefully delineated guidelines and only involved very small sums of cash. As such, this was not an important monetary flow (ibid).

[7] Only in the course of the 1987-88 reforms were enterprises granted greater autonomy in the allocation of their internally generated funds, in particular, in the payment of wages and bonuses (IMF et al. 1990).

[8] A centrally planned economy allocated its capital administratively, without resort to rates of return or other measures of profitability. According to the Marx's labour theory of value, capital was regarded as a free factor of production and was allocated to enterprises as an interest free grant. Only since the late 1960s an interest like criteria for allocating investments within administrative units, that implicitly introduced rates of return and other capital profitability criteria into the investment decision, began to be used. However investment allocation, according to the principle of priority, remained dominant, which made efficiency indexes insignificant in making investment decisions. Investment funds were continuously determined administratively in the investment plan, which in turn followed the output plan of the economy. For more details see Barkovski (1976).

control enterprise plan fulfilment, extension of short-term loans during the production period was a principal monitoring device. There was also need to draw attention to the fact that while dealing with short-term credits Monobank had no experience in providing long-term investment credits. The latter, usually provided by the Investment bank, bear more resemblance to subsidies rather than loans. The Monobank also monitored payments to the population since enterprises, besides having non-cash accounts for enterprise transactions with bank, drew on cash accounts for wage payments. While Monobank served the industrial sector, the state-owned Savings bank was a monopolist in serving households. In some countries a confederation of co-operative banks collected deposits for agriculture cooperatives. Despite this, the overwhelming majority of household savings (80-85 per cent on average) was collected by the Savings bank. The bank was required to transfer excess funds (money collected from deposits and not used for consumer loans, or for countries where consumer loans were not allowed) into the Monobank (Petrick 1998)[9].

Finally one can question how the balance between money supply and output was offset to ensure price stability. One of the main goal for an effective monetary policy is to keep the level of aggregate expenditure in an economy broadly consistent with production capacity; in words of Benjamin Cohen (2001, p.198), '*...to guide the ship of state between Scylla of rampant inflation and the Charybdis of prolonged recession.*' While monetary policy in a market economy is carried out through the use of money, exchange rate and interest rates as market instruments, there is an obvious lack of them in a planned economy. The value of the good was determined not by supply and demand as in a market economy but rather by plan. Thus the overall cost of production was centrally determined by the state and it was distorted. The equality between the wage payments and consumption goods valued at administratively-fixed prices was a key condition for the equilibrium of the system (De Melo and Denizer 1997). However, from the early 1980s this mechanism could no longer assure macroeconomic stability Some imbalances became apparent, such as the fact that incomes were growing faster than production. By the end 1970s the limits of continued rapid mobilisation of capital and labour had been reached and rigidities in the system hindered the increases in productivity needed to sustain output, triggering a decline in economic growth from 8 per cent in the second of the 1960s to 3 per cent in the first half of the 1980s (IMF et al

[9] For an interesting discussion of the banking system in a planned economy see also Podolski (1973), Zwass (1979), Garvy (1977) and Kuschpèta (1978).

1990, p.3). The economic slowdown started in such branches of the FSU economy as light and food industries, agriculture and services which were labelled as less important ones in comparison with heavy industry and thus were given less priority in terms of centralised resources distribution, that made them lack of the necessary financing, and gradually led to a slowdown in their production growth. During different periods of time the authorities used different ways to offset a growing discrepancy between a consumer demand and supply. For example, whereas during 1930-50s in the Soviet Union there were popular so-called 'corrective methods' such as non-monetary forms of remuneration in agriculture, the use of unremunerated labour force in the GULAG system and so on, in the 1960s it was done mainly through manipulating relative prices, and in the 1970s - by a relatively increase in inflow of imported goods (Zhukov 1993). All these measures aimed at absorbing an overhang in the population's cash on hand to bring their consumption in line with a production capacity and prevent suppressed inflation[10] turning into open inflation. This problem was further aggravated when in early 1980s enterprises in the Centrally Planned Economies (CPE) were given more freedom with their profits, including a permission to retain part of the profits to pay bonuses to workers that raised wages above sustainable level consistent with price stability and production growth. In turn it resulted in the problem of the consumer goods' scarcity becoming more obvious and as a result the introduction of rationing cards. The only reasonable way to offset this growing gap was a general rise in price level. However, the authorities stressed the choice of continuing the practice of granting subsidies to enterprises to support them and thus generated inflationary pressures[11] and goods shortages (IMF et al. 1990).

By summarising the above we can identify the following legacies inherited from the Soviet system that, to a greater extent, gave rise to the view that market reforms in line with the 'Washington consensus' were needed and which have inspired the transition process (see, for example, Lavigne 1999).

1. De Melo and Deniser (1997) reported relatively high ratios of M2 (regarded as broad money) to GDP, averaging around 42 per cent in pre-transition period (1989-1991) in socialist countries. By the end of the 1980s rapid monetary growth in a

[10] Increase of 'unwanted savings' in the savings banks could be used as one of the indicator of a repressed inflation (Lavigne 1999, p.61).

[11] Increases in subsidies along with the decline in the value of foreign trade (as a result of a sharp decline in world oil prices in 1986) were the major reasons of fiscal performance worsening; the fiscal deficit monetized by the Monobank rose from around 2.5 per cent of GDP in 1985 to more than 8.5 per cent of GDP by 1987 (IMF et al 1990).

situation of unchanged administered prices resulted in mounting excess liquidity, two thirds of which was accounted for by household holdings of cash and deposits (IMF et al. 1990). Therefore, to absorb the monetary overhang the experts of the IMF and World Bank advocated price liberalisation (IMF et al 1990). Along with price liberalisation, curbing the ensuing inflation appeared to be another main challenge for macroeconomic policy. This required cutting government expenditure and tightening the monetary and credit emission. Liberalisation of interest rates was required to increase the attractiveness of bank deposits in order to direct households' cash into savings.

Therefore, the relatively high financial ratios mentioned above did not indicate financial development, as they do in market economies; they were rather reflecting this macroeconomic disequilibrium (De Melo and Denizer 1997). The abolition of the plan should have led, in fact, to a monetary vacuum, particularly as far as the enterprise circuit was concerned. The proclaimed price liberalisation eliminated the monetary overhang 'much more quickly than anticipated through price hikes' (Lavigne 1999, p.117), and wiped out households' savings – the primary source of credit expansion to enterprises in transition to a market economy. It also eroded the real value of enterprises' deposits. Thus, the authorities did not have much room for manoeuvre at the early stage of transition other than to continue a practice of 'soft budget constraints'[12].

2. Besides a money vacuum, transition economies also inherited an institutional vacuum as a result of sharp differences in the role and basic principles of functioning of financial systems under planned and market economies. The financial institutions of the Soviet system had no experience of effective allocation of resources; for example, ranking the projects by risk and return, or monitoring their borrowers etc. The capital market was completely absent under socialism due to the state-dominated ownership and the absence of financial instruments typical of a market economy. Thus, recession during the early period transition could be partly explained by the inadequate supply-side response in terms of an underdeveloped financial system. Banking reform and the creation of capital markets were viewed as one of the main building blocks of stabilisation-cum-transformation process. Moreover, enterprises' restructuring and privatisation were seen as the necessary complementarities of financial sector reform.

[12] The concept of soft budget constraint was first introduced by Janos Kornai (1986) who argued that in socialist economies the financial constraint on the enterprise is ex ante 'soft', meaning that the socialist firm is not concerned with negative profit in the future, since it can expect to get financial subsidies in the future in case of economic failure.

3. Due to the imprudent and ineffective practice of enterprise financing under socialism, when the extension of credit followed government directives and was not governed by profit considerations, the banks of the Soviet system inherited a significant amount of non-performing loans. According to an estimate from the EBRD, bad debts amounted to 60 per cent of the balance sheets of the eastern banks at the beginning of the transition (Lavigne 1999, p.188). Moreover the amount of bad debts continued to grow during the early stages of transition due to the continuing practice of banks to lend to affiliated enterprises[13] or, under official pressure, to loss-making state-owned enterprises to keep them afloat. On the one hand, macroeconomic stabilisation, banks' privatisation and restructuring accompanied by enterprise and legal reforms were the way to address this problem. On the other, the problem of non-performing loans in banks' portfolios could potentially manifest into a problem of moral hazard and adverse selection, were it to be dealt in a very radical way without taking extra precautions (to be discussed in section 4.3).

In summary, despite socialist economies differing substantially in their initial conditions, such as the level of income, the nature and extent of economic distortions and the level of institutional development[14], transition from a planned economy to a market economy can still be considered as a common process if it is put in the context of the above-mentioned legacies inherited from the Soviet system (De Melo et el. 1997). Thus, stabilisation programmes envisaging price liberalisation, cuts in government spending, controls over nominal wages increases, foreign trade liberalisation (through achieving current account convertibility and devaluing the domestic currency to the market rate) and accompanied by structural reforms (privatisation, bank and financial sector reforms, tax reform etc.) appeared to shape transition of CEE and FSU countries from a planned economy to a market economy. In principle, 'these packages applied the methods already experimented with in developing countries' (Lavigne 1999, p.113). The differences in transformation experiences across the countries lay mainly in sequencing and the speed of the suggested measures, or in other words in their choice between 'Big-Bang' ('Shock therapy') and gradualism approach[15] with an emphasis in

[13] Banks, which were created from the commercial departments of the Monobank, were segmented by the industrial sector, or rather by clients, taking into account that the manufacturing sector inherited from the Soviet system was characterized by a high degree of vertical industry integration and reliance on very large plants. For more details see the following section.

[14] For a discussion of the importance of initial conditions and other country-specific factors in the transition experience see De Melo et al. 1995.

[15] 'Shock therapy' (ST) envisaged radical transformation of the economy following neo-classical vision

the choice preference stressed on rapid reform by the IMF and World Bank experts (De Melo et al. 1997, p.63). Therefore, fast formation of competitive markets free of government intervention became the mantra of the conventional transition approach.

4.2 Drawing on the Patterns of Transition

The initial shock for all transition economies was the collapse of the administrative planned system itself. It predetermined the transformational recession in socialist countries marked by initial fall in output. The collapse of the CMEA resulting in the breakdown of trade agreements, the elimination of subsidies, the increase in prices of imported energy and gas and general inefficiency and partial obsolescence of capital stock inherited from the Soviet system laid the basis for the downward trend of output in post-communist countries. Price liberalization caused a strong upward inflationary pressure. The latter was challenged by tight monetary policy envisaging reduction in central bank credit and liberalization of interest rates. Consequently, the following decrease in aggregate demand further aggravated output fall[16]. Thus, at the early stage of transition post-communist economies faced the main trade-off between a policy of maintaining output and employment, on the one hand, and stabilisation policy, on the other hand (see, for example, de Melo et al. 1997, de Melo and Denizer 1997). The latter envisaged economic liberalisation (as discussed earlier) and promised output recovery, although a deeper recession entailing high social costs was inevitable to precede the growth trend. The choice of either policy was determined politically (to be discussed further).

Countries that were strongly committed to driving towards the free market – most of the CEE countries and the Baltic countries – followed the conventional transition approach and introduced deflationary policies with high positive interest rates and a tightening of money emission as the major anchors of stabilisation policies. They were also faster in liberalising foreign trade and capital account.

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and was views as 'a kind of insurance against any temptation to look for a 'third way' (any version of 'market socialism')' (Lavigne 1999, p.119). This pattern of transition was characterized by a sharp initial fall in output and living standards and thereafter recovery and growth followed. The gradualist line of thought mainly stressed that ST could not be applied to structural transformation, as the latter takes longer time. The second argument was that beneficial outcomes attributed to ST might have been obtained at a lesser social cost (ibid, p. 120).

[16] See Calvo and Coricelli (1993).

Other countries, notably the majority of states of the former Soviet Union (FSU), were slower in responding to the challenges of transition. Many of them, such as Belarus, Uzbekistan and Turkmenistan were lagging behind, but performed better in terms of output decline at the very beginning of the 1990s. They chose a policy of maintaining output and employment through providing lax credits and subsidies to state-enterprises, a negative real interest rate policy and repressed inflation. The liberalisation of foreign trade and privatisation occurred at a slow pace. The viability of this policy-making was possible due to the excessive government intervention in the economy.

In their study of the impact of economic liberalisation on stabilisation and economic growth de Melo et al. (1997) distinguish four groups of countries by their response to market reforms. The degree of reforming is measured by a 'Cumulative Liberalisation Index' (CLI), composed of three weighted components: liberalisation of internal markets (liberalisation of domestic prices and abolition of state trading monopolies); liberalisation of external markets, including a free foreign trade regime, elimination of all trade controls but 'low-to-moderate' import duties and current account accountability; and liberalisation of private-sector entry, encompassing privatisation of small-scale and large-scale enterprises and banking reform. All transition economies were grouped as follows: Group1 - "advanced reformers" (CLI >3); Group 2 – "high intermediate reformers" (2<CLI<3); Group 3 – "low intermediate reformers" (1.3<CLI<2); and Group 4 – "slow reformers" (CLI < 1.3) (ibid, pp. 23-24). De Melo et al. (1997) argue that there exist positive relationships between the degree of economic liberalisation, stabilisation and economic growth. Table 4.1 shows variations of liberalisation-growth-inflation patterns across the region in 1989-1994.

De Melo's et al. (1997) findings suggest that liberalisation appears to be an essential engine of growth; it accelerates economy revival mainly through structural change of the economy, expanding formerly repressed activities such as domestic trade, financial services and exports to market economies, while entailing the contraction of 'overbuilt' sectors, namely industry and agriculture. They estimate that 'on average...the expansion of repressed sectors begins to offset the contraction of overbuilt sectors after about three years of reform' (de Melo and Gelb 1997, p.76, quoted in Lavigne 1999, p.159).

Country	CLI	Average liberalisation 1993-94	Average inflation 1993-94	Average growth 1993-94	1993-1994GDP /1989GDP
Advanced reformers					
Slovenia	4.16	0.82	26	3.0	84
Poland	4.14	0.84	34	4.2	88
Hungary	4.11	0.84	21	0.0	81
Czech Republic	3.61	0.90	16	0.0	81
Slovak Republic	3.47	0.86	19	0.4	79
Average	3.90	0.85	23	1.7	83
High intermediate reformers					
Estonia	2.93	0.85	69	0.9	69
Bulgaria	2.90	0.68	81	-1.4	73
Lithuania	2.72	0.79	231	-7.3	44
Latvia	2.45	0.71	73	-4.4	60
Albania	2.30	0.70	57	9.5	74
Romania	2.29	0.66	194	2.2	69
Average	2.55	0.72	124	.03	67
Low intermediate reformers					
Russia	1.92	0.63	558	-13.5	57
Kyrgyz Republic	1.81	0.68	744	-13.2	61
Moldova	1.62	0.53	558	-17.0	53
Kazakstan	1.31	0.37	1,870	-18.5	57
Average	1.67	0.55	933	-15.6	57
Slow reformers					
Uzbekistan	1.11	0.37	640	-2.5	89
Belarus	1.07	0.35	1,694	-16.6	73
Ukraine	0.80	0.20	2,789	-18.6	56
Turkmenistan	0.63	0.19	2,751	-15.0	69
Average	0.90	0.27	1,968	-13.2	72

Table 4.1: Liberalisation, growth, and inflation, 1989-94[17]

Moreover, they identify quasifiscal deficits[18] and monetary expansion as the main spurs to inflation. Thus, they conclude that despite initial sharp decline in output 'advanced

[17] De Melo et al. (1997, p. 28). Here it should be noted that the advanced reformers were the earliest starters in the process of liberalization. The first economic reforms in these countries began in the 1960s, while in the FSU countries they did not start until 1986.

[18] De Melo et al. (1997, p.53) define quasifiscal expenditures as 'implicit subsidies resulting from the provision of credit to banks and firms at highly negative real interest rates', 'implicit subsidies in connection with foreign exchange guarantee schemes' and 'extrabudgetary financing for debt writeoffs'.

reformers' managed either to stabilize their economies or even accelerate economic growth in 1993-94, while 'slow reformers' continued experiencing transition recession in 1993-94, although Uzbekistan appeared to diverge from the main pattern[19].

According to de Melo and Denizer (1997) the countries, classified earlier as 'slow reformers', were also more reluctant in switching to the use of market-oriented instruments in their monetary policy. Unlike the previous study here de Melo and Denizer use broader classification, distinguishing only two groups of transition countries depending on their general response to market reforms. The first group, called a 'fast response' group, includes most of the CEE countries, the Baltics, the Kyrgyz Republic and Moldova. These countries introduced relatively tight monetary policy to accompany stabilisation. Their patterns of transition experience vary across the group mostly in terms of the choice of nominal anchors of stabilisation[20]. The second group is termed as 'slow response' group and it includes most of the non-Baltic FSU countries, FYR Macedonia and Romania. De Melo and Denizer (1997, p.6) attribute the slow response of these countries partly to the institutional arrangements preserved in these countries at the beginning of transition.

Thus, after the dissolution of the Soviet Union at the end of 1991 nine CIS countries including Belarus stayed in the rouble zone aiming at benefiting as free-riders from credit expansion within the rouble zone and getting cheap energy resources. However, the split of money circuits, and the inability of the national governments to print money[21], that was the privilege of the central bank of Russia, restrained their credit expansion to some extent. The consequences of that were the introduction of coupons in some of these countries printing of which could partially supplement the 'missing' cash in roubles, and the appearance of the premium between cash traded over non-cash. The latter according to the findings of Gros and Steinherr (1995) could exceed 30-50 per cent and serve as an indicator of the degree to which credit expansion outside Russia has been larger than in Russia. Later on, the restrictions on credit expansion led to the collapse of the rouble zone and the introduction of the national currencies in its former country-members.

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[19] See Zettelmeyer's (1998) study on the Uzbek growth puzzle.

[20] Thus, for example, while Poland, Czechoslovakia and Estonia adopted stabilization programmes based on fixed exchange rate regimes after relatively devaluating their currencies, other CEEs, Moldova and Kyrgyz Republic relied on money supply as the main nominal anchor (de Melo and Denizer 1997, p. 5). See also Lavigne (1999, p. 130-31).

[21] The banking system requires the central bank to increase the monetary base for credit expansion by the former.

Following de Melo and Denizer (1997) there can be distinguished six instruments that can affect monetary developments. They are grouped as direct (set in a form of regulation) and indirect (market-based) instruments. Directed credit, credit ceilings and interest rate controls are related to the first group of instruments; reserve requirements, refinance/discount facilities, government and central bank bills and bonds are regarded as indirect instruments. Financial depth is associated with abolition of credit ceilings, the developments of markets for government papers and the use of market-oriented refinancing window, while directed credit is defined as a spur to inflation in transition economies.

De Melo and Denizer (1997) use the following criteria to classify each instrument as market-oriented or not.

For direct instruments: Market-orientation is defined by low reliance on the three direct instruments: (a) central bank directed credit less than 25 per cent of total credit; (b) an absence of bank-by-bank credit ceilings (some of which may have been replaced by an overall ceiling on central bank net domestic assets); and (c) an absence of restrictions on deposit and loan rates (de Melo and Denizer 1997, p. 10).

For indirect instruments: Market-orientation is defined by the introduction and use of market-oriented forms of indirect instruments, namely: (a) maximum reserve requirements equal to 12 per cent or less; (b) a refinance window with auction or non-preferential rates and/or rediscount/Lombard facilities; and (c) government or central bank securities used for monetary operations or actively traded in a secondary market (ibid, p. 10).

Table 4.2 groups transition economies into four groups depending on their degree of market orientation in the context of monetary instruments use. 'High' market orientation means that these countries use 5 or 6 instruments classified as market-oriented; 'substantial', 'moderate' and 'low' respectively show the use of 4, 3 and 1-2 instruments regarded as market-oriented.

High	Substantial	Moderate	Low
Bulgaria	Croatia	Albania	Armenia*
Czech Republic	Lithuania	Azerbaijan*	Belarus*
Estonia	FYR*	Georgia*	Kyrgyz Rep.
Hungary	Macedonia	Kazakstan*	Moldova
Latvia		Mongolia*	Turkmenistan*
Poland		Russia*	Tajikistan*
Romania*			Ukraine*
Slovak Republic			

Table 4.2: Market orientation of monetary instruments at end-1994[22]

Following their findings 1) during the early phase of transition, all CEE and FSU countries seem to have relied on at least one and often all three direct instruments in the implementation of monetary policy. Thus, nearly all 'fast response' countries except from Hungary and Poland exercised a policy of directed credits as late as 1990 and, particularly, Czech Republic and Bulgaria had ceilings officially enforced by authorities on commercial bank credits. 2) By the late 1994 some countries (mostly FSU) had retained interest rate controls and had reserve ratios set in excess of 12 per cent. 3)'Fast response' countries seem to have switched more quickly from direct to indirect instruments. By 1995 refinancing of commercial banks in these countries was mainly carried through the rediscount or Lombard mechanisms. However, in many FSU countries loans were still granted at preferential rates to direct them to priority sectors of the economy (ibid, p.12). As late as 1994 the Belarusian National Bank continued the supply of directed credits at subsidised rates, although a positive shift in government policy was an introduction of credit auctions in April 1994 as a way of refinancing commercial banks. Moreover, interest rate controls were reintroduced (after being cancelled in 1991) in the form of time deposit floors and margin controls that, in fact, had a positive impact on economic development, as it addressed market failures (to be discussed further). Turkmenistan seems to have had a greater progress by 1994-96 in relying on market-oriented monetary instruments than Belarus and Uzbekistan. Reserve

[22] The table is adapted from de Melo and Denizer (1997). An asterisk denotes countries stabilizing relatively slowly.

requirements were unified for all types of deposits at 11 per cent, as well as market allocation of credit resources (through auctions) was declared in January 1996. However, directed credit schemes and caps on deposit and lending interest rates were kept. Moreover, Turkmenistan did not advance much in developing a market of government securities, when in Belarus both government bonds and commercial banks' bills were introduced into circulation, although on a primary market only. Finally, in terms of the use of monetary instruments Uzbekistan was the least market-oriented out of the three countries. Refinancing auctions were introduced in August 1993, but they were used on a limited scale. In May 1994 reserve requirements were increased up to 30 per cent on deposits less than three years; loans to banks continued to be subsidized by the Ministry of Finance, while subsidized Central Bank loans discontinued.

Finally, it will be interesting to turn to some studies attempting to provide an explanation of what determined countries' choice of either transition patterns.

As mentioned in chapters 2 and 3, a public finance motive was named as one of the typical reasons lying behind the introduction of financial repression in developing countries. That can also be regarded as a reason why governments resort to inflationary financing, namely inflation tax (chapter 7). The idea is that revenue losses from direct taxes can be offset by introducing implicit forms of taxation through FR or inflation tax. However, relatively low figures of budget deficit varying between 0.2 per cent and 3 per cent of GDP in some transition economies that experienced financial repression at some time (for example, Belarus and Turkmenistan) question the applicability of this theory to explaining rationale for introducing FR in these countries. In fact, in transition economies, at least at the early stages of transformation or in some countries even at present, the distinction between public and private is blurred[23], which implies that along with a budget deficit it is common to have a quasi-budget deficit. This, for example, explains the phenomenon of low budget deficit in some transition economies when one would assume it to be much higher. In the countries with a high share of state-ownership, with slow pace of reforms and a high degree of state interference into economic activity the quasi-budget activities in the form of supplying 'planned funds', or directed credits and preferential loans to state-owned enterprises (SOE), have become very common practice.

[23] Thus, for example, the private sector in Belarus includes mixed ownership with the state share often in excess of 50 per cent (for more details of the peculiarities of privatisation in Belarus see chapter 5).

However, Denizer et al. (1998, p.5) question the applicability of the public-finance approach to post-Communist transition economies, arguing that this approach fails to explain 'why different governments facing similar budgetary constraints might choose to regulate their financial systems differently'. In turn, they contend that institutional differences among political systems are what provide an insight to understanding the variations in financial policy-making across different countries. By examining the dispersion and concentration of political power in governments on financial policy, they find that legislatures with greater proportional representation of Communists, with less party competition and government opposition are more likely to resort to repressive controls in financial sectors. However, the greater parliamentary polarization and fragmentation, the higher support for financial liberalisation. In their work, de Melo et al. (1997) find that index of political freedom is positively and highly correlated with a degree of liberalisation[24]. In studying the financial market reform in the Czech Republic in 1991-1994 Desai (1995) comes to the conclusion that financial repression has political sources. He argues (1995, p. 1),

> 'It is in the Czech Republic that reformers, fearing that bankruptcies of the largest firms will send unemployment figures soaring and strengthen the hand of the opposition, are led to design institutional structures which allocate credit to vital industries, which swap bank debt for equity in these firms, and which generally enable some government discretion in corporate finance.'

Thus, both financial repression and financial liberalisation represent a certain policy choice, which is 'governed by constraints and incentives facing policy makers' (Denizer et al. 1998, p.5).

4.3 Banking and Financial Markets Reform in Transition Economies

The development of the financial sector was marked by the dismantling of the monobank structure, so putting an end to central bank monopoly of credit allocation. By splitting the monobank into state-owned commercial banks, a two-tier banking system

[24] According to their estimates the Spearman and Pearson correlation coefficients for all 26 CEE and FSU countries were equal to .8 and .75 respectively (de Melo et al. 1997, p.59).

has emerged across the post-socialist region. What was specific to the new financial institutions' establishment in transition economies?

The commonality in developments in financial sectors across countries lies in emerging primarily bank-based financial systems. The patterns of financial transformation vary depending on the adopted strategies of restructuring bad debts, privatisation methods of banks and enterprises, policies toward foreign entry and entry of new banks in the banking sector and stock market development.

The following patterns can be traced of newly established banks and their distinctive features of operation in the early transition.

1. **Sectoral segmentation of banks.** Banks, which were created from the commercial banking departments of the Monobank, were segmented by industrial sector or by geographic region. In the case of the FSU in the same way there emerged specialised banks, Promstroibank for financing industry, Agroprombank for financing agriculture and Zhilsotsbank for housing construction purposes. Along with them two specialised banks that existed in the Soviet Union, the savings bank, servicing households, and the foreign trade bank, financing export-import transactions, continued their activity.

Sectoral segmentation of banks immediately brought to the surface the problem of creditor dependence and limited portfolio diversification, which exposed these banks to the failure of their clients, which in their majority were the largest state-owned enterprises. The productive sector in a central planning economy was characterised by a high degree of vertical integration and reliance on very large plants. Together with the problem of mass indebtedness of enterprises, emerging at the eve of transformation and jeopardised during its early stage, the segmentation of banks by clients and sectors could have triggered a chain of bankruptcies to follow in a domino effect.

Along with sectoral or specialised banks, new banks were also established and have mushroomed over time. The majority were established by state-owned enterprises that turned direct state ownership into indirect ownership and brought to the surface the problem of connected lending. Despite the amount of emergent banks the competition in the banking sector across the region remained very low in the early -medium stage of transition, which can partly be explained by the patterns of banks' establishing, making the market very segmented. The presence of sectoral and specialised state-owned commercial banks (SOCBs) made the banking environment very concentrated with around 60-70 per cent of the total banking assets controlled by 5-6 SOCBs. On the other

hand, other new banks, so-called 'pocket banks', were mainly established by enterprises to serve the purpose of financing their own activities. Most of them quickly became insolvent (see, for example, Rostowski 1995, Berglof and Bolton 2002).

2. At the early stage of banking operation **the separation between retail and enterprise banking** was preserved and this could also be regarded as a Soviet legacy, where the process of the collection of savings was distinct from its allocation to enterprises. The Savings bank traditionally continued to hold all household deposits, and enterprise accounts were divided between these newly-established banks. A separation of activities, a huge portfolio of bad debts together with macroeconomic instability aggravated the problem of undercapitalisation of the banking system.

Bad debts appeared as one of the issues in continuing debates. Resolving it was of particular importance as it potentially could trigger a problem of adverse selection and moral hazard. High reserve requirements imposed on banks because of bad loans often led them to seek higher profits through increasing spreads between deposit and lending rates (Lavigne 1999, p.187). Due to an adverse selection effect, 'good borrowers', who deserved to get credit by all means, had to pay higher rates of interest on credit. Moreover, in the situation of the absence of an adequate prudent regulatory framework, which was the case for most transition economies, the problem of bad debts triggered a problem of moral hazard when already insolvent banks continued persuading the central banks to obtain credit resources, and raised interest rates to attract households' investment. In these circumstances abolishing interest rates ceilings and deposit floors quickly could be regarded as premature (de Melo and Denizer 1997, p.9). For example, liberalisation of interest rates (removal of margin controls between 1991 and 1994) in Belarus triggered some banks, particularly in regional centres, to behave as monopolists. The evidence reported by the National Bank of Belarus (NBB)[25] suggested that banks in pursuit of high profits had tended to decrease as much as possible the deposit rate and in turn increase the lending rate. Thus, by setting deposit floors and margin controls in 1994 the authorities made an attempt to end this practice. Therefore, in the present case deposit floors introduced by the NBB from 1995 played rather a positive role in alleviating banks' attempts to exploit market power.

Commercial banks, particularly in FSU, being tempted by high returns, also tended to get involved in speculative operations with selling credit resources in

[25] See, for example, NBB telegram 'On bank interest payments for using clients' money', No 20-95 (14 April 1995).

interbank markets[26] or with government securities than lending to enterprises. The Russian case around the dates of the 1998 financial crisis was, perhaps, the worst example of manifestation of problems of adverse selection and moral hazard. Under the pressure of structural adjustment programmes, the Russian government became convinced that bond financing was the only alternative to monetary emission in financing the budget deficit. The Ministry of Finance, together with the Russian Central bank, were thoroughly issuing and servicing a series of government bonds, attracting short-term investors with extraordinarily high yields; the latter - up to 100-200 per cent - initially set up many times above the profitability of the real sector. Being tempted by high interest rates promising large profits and quick returns, Russian banks get involved in operations with securities, by that diverting funds from real sector. Moreover, Russian banks were riddled with 'domestic' conflicts of interest. Their directors lent freely to their friends, to themselves, and to powerful politicians. They misspent their depositors' funds, including those of state agencies. They built up vast structures of bad loans, which they carried from year to year, and became increasingly vulnerable[27].

There were proposed two possible solutions for wiping out bad debts, either a complete write-off of debt or inflation. Thus, Begg and Portes (1991) and Schmieding (1991) argued in favour of the first way of solving the problem of bad debts because the economic irrationality of the initial allocation of credit under central planning, points to the risk of liquidation of economically viable enterprises and of the risk of the bankruptcy of a significant number of banks. But this solution potentially had two problems: credibility in the future and that the bad debt problem was not only a stock problem but a flow problem as well. To a great extent, inflation helped to solve a problem of non-performing loans, although it did not solve the flow problem (Rostowski 1995, p. 20).

There also existed two more common approaches to resolving a problem of bad debts. The first one was the 'decentralization approach' when banks themselves dealt with enterprise borrowing and lending decisions through internal workout departments. This approach was undertaken in Poland. The enacted Law on Financial Restructuring of Enterprises and Banks in 1993 authorized banks to conduct financial restructuring of indebted enterprises while setting the deadline by which all bad loans had to be

[26] See, for example, NBB telegram No 2-96 (26 January 1996) and No 5-96 (14 May 1996).
[27] See Gustafson 1999, p. 79, and Komulainen and Korhonen 2000. For a discussion of the role of deposit insurance in manifestation of moral hazard problem in CEE and FSU countries see Boot and Wijnbergen (1995, pp. 42-57).

restructured or sold off. Otherwise bankruptcy procedures had to be initiated. The restructuring programme was based on debt-for-equity swap schemes which was argued as 'leading to conflicts and concentration in power' (Fries and Lane 1994, p.131).

A 'centralized approach' meant that banks transferred or sold bad debts to a government itself or a government - affiliated institution. As put by Murinde and Mullineux (1999, p. 6) this allowed the banks to be free of their inherited debt and increased the speed and likelihood of privatisation. On the other hand, critics argued the reverse, namely that it created a moral hazard problem in the sense that banks would expect to be bailed out again if they made further bad loans – which they were likely to, given their inexperience and the fact that they are operating in the highly uncertain environment.

The centralised approach took many forms, leading to a variety of financial structures with the development of different instruments. Among them can be listed the following: recapitalisation of banks with a further privatisation where financing is likely to come from the government/state treasury department and international financial institutions, such as the European Bank for Reconstruction and Development (EBRD); through involving bankruptcy procedures and enterprise restructuring, where the latter can also be based on equity-for-debt swaps; through selling bad debts at a discount; and finally, through swapping bad debts for government bonds. By offering government bonds, non-performing assets are replaced with earning assets. However, unless there is a functioning secondary market for government bonds, banks would have to hold on to the bonds until maturity, which could effectively reduce liquidity in the banking sector[28].

The problem of bad debts was closely related to the issue of privatisation of banks in transition economies. A reasonable question emerged: what should have taken priority: resolving of problem of bad debts, that could make banks more attractive for potential investors, or the other way round that could protect banks from a new flow of bad debts. The patterns of privatisation of the banking sector vary across the region, commencing from public offerings through the mass privatisation process as in Czech Republic and Russia, and finishing with selling banks to foreign investors 'case-by-case', as occurred in Hungary. Poland sold its three healthy banks first, and then undertook the so-called 'Enterprise and Bank Financial Restructuring Programme'

[28] For more details on this issue see Murinde and Mullineux 1999, p. 8.

(EBFRP) so as to be able to privatise the next tranche. The Czech Republic seems to have privatised its banks before the magnitude of its bad loans problem had manifested.

Lavigne (1999, p.191) recognises the need for capital markets as a precondition for privatisation. The lack of capital markets, even in the countries, which have introduced a stock exchange, was indeed obvious, and prevented large-scale privatisation through public offerings. On the other hand, it would be reasonable to expect the development of stock markets to be driven by the extent and the method of privatisation. Between 1992 and 1995, the period of most intense privatisation, turnover typically overshot the levels characteristic of other emerging markets. The explanation for this unsustainable surge of stock-market activity lay in the structure of privatisation in many transition economies. However, as it was noted earlier most mass privatisation programmes were not carried out through initial public offerings on the stock market. Rather, they were accomplished by voucher privatisations (the former Czechoslovakia and in Russia). This method of privatisation implied low initial asset valuations, which translated into low market capitalisation. Shares were given to households at a fraction of their true costs. The strong link between privatisation and stock market development, when market capitalisation tends to increase with the extent of privatisation, was confirmed by the EBRD experts on analysing the relationship between stock-market capitalisation and the EBRD transition indicator for large-scale privatisation (EBRD 1998, p. 97). Equity markets in transition economies have been regarded, as shallow by international standards with almost no corporate bond market. The bond market has been mostly represented by government securities, regarded as a non-monetary source of financing budget deficit, and thus highly recommended by the Western experts to use as alterative to monetary emission in financing budget deficits. To make this instrument attractive government bonds were supported by high interest rates across the region, and that in turn increased the domestic debt burden. This financial instrument was also attractive for banks from the point of view that government securities did not count towards obligatory reserves, they were tax-exempted and at the same time they brought high yields. All together this tempted both governments and banks in some countries to use it excessively and finally led to this market's collapse when governments were unable to service their debt any more, as it was shown in the case of Russia.

In summary, transition economies appeared to be different from each other in their experience of restructuring financial sector, beginning from the adopted strategies

and finishing with their progress resulting in different economic outcomes[29]. 'Fast reformers', demonstrating higher progress and strong commitment towards market reforms managed to boast an economic recovery after the initial drastic fall in output. However, 'slow reformers', in particular those who attempted to maintain output and employment rates at the expense of a repressed economy, on average performed well at the early stage of transition[30], but nevertheless went into transition recession after that. However, they managed to avoid any major bank failures. Most of the FSU, and some CEE, which embarked on liberalizing their economies, faced with problems of adverse selection and moral hazard (in particular, when interest rates liberalization proceeded) and underwent banking and currency crises[31]. A legacy of non-performing loans, premature financial liberalization, an early pattern of financial institutes establishment based on cross-ownership, insufficient prudential regulation, and 'large opportunities and incentives for fraud' all seem to have contributed to dramatic bank failures (Lavigne 1999, p.189). So, the question is whether financial repression can mitigate economic transformation in post-socialist countries and, therefore, can be regarded as an alternative policy accelerating economic growth?

The main purpose of this chapter has been to examine more fully the financial sector restructuring in transition economies to establish to what extent they appear to replicate policies associated with financial repression. The analysis revealed the following.

Most of the empirical studies on the phenomenon of financial repression reviewed so far in chapters 3 and 4 focus on developing countries and only a few are available with a reference to transition economies (see section 4.2). Moreover, in the conventional literature the term 'financial repression' is not generally directly applied to transition economies, although, as we have seen in the earlier sections of chapter 4, there is no doubt that most of the studies of financial systems in transition proceed along 'financial repression' framework.

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[29] Appendix A shows the progress of reforming the financial system, both in banking reform and in non-bank financial institutions and securities markets, in some selected transition economies in 1991-2001. As can be seen from tables A.1 and A.2, Belarus, Turkmenistan and Uzbekistan appear to be laggards in the financial sector reforms.

[30] Thus, real growth (measured as a percentage change) in Belarus was estimated at –9.6% in 1992 compared to –14.2%, -34.9 and –21.3 % in Estonia, Latvia and Lithuania respectively (EBRD 1998, p.50).

[31] For example, banking crises in Latvia and Lithuania occurred in 1995, Bulgaria, Romania and Czech Republic – 1996-97, Russia - 1998. For a discussion of this issue see Keuschnigg 1997, Steinherr 1997 and EBRD 1998.

interbank markets[26] or with government securities than lending to enterprises. The Russian case around the dates of the 1998 financial crisis was, perhaps, the worst example of manifestation of problems of adverse selection and moral hazard. Under the pressure of structural adjustment programmes, the Russian government became convinced that bond financing was the only alternative to monetary emission in financing the budget deficit. The Ministry of Finance, together with the Russian Central bank, were thoroughly issuing and servicing a series of government bonds, attracting short-term investors with extraordinarily high yields; the latter - up to 100-200 per cent - initially set up many times above the profitability of the real sector. Being tempted by high interest rates promising large profits and quick returns, Russian banks get involved in operations with securities, by that diverting funds from real sector. Moreover, Russian banks were riddled with 'domestic' conflicts of interest. Their directors lent freely to their friends, to themselves, and to powerful politicians. They misspent their depositors' funds, including those of state agencies. They built up vast structures of bad loans, which they carried from year to year, and became increasingly vulnerable[27].

There were proposed two possible solutions for wiping out bad debts, either a complete write-off of debt or inflation. Thus, Begg and Portes (1991) and Schmieding (1991) argued in favour of the first way of solving the problem of bad debts because the economic irrationality of the initial allocation of credit under central planning, points to the risk of liquidation of economically viable enterprises and of the risk of the bankruptcy of a significant number of banks. But this solution potentially had two problems: credibility in the future and that the bad debt problem was not only a stock problem but a flow problem as well. To a great extent, inflation helped to solve a problem of non-performing loans, although it did not solve the flow problem (Rostowski 1995, p. 20).

There also existed two more common approaches to resolving a problem of bad debts. The first one was the 'decentralization approach' when banks themselves dealt with enterprise borrowing and lending decisions through internal workout departments. This approach was undertaken in Poland. The enacted Law on Financial Restructuring of Enterprises and Banks in 1993 authorized banks to conduct financial restructuring of indebted enterprises while setting the deadline by which all bad loans had to be

[26] See, for example, NBB telegram No 2-96 (26 January 1996) and No 5-96 (14 May 1996).
[27] See Gustafson 1999, p. 79, and Komulainen and Korhonen 2000. For a discussion of the role of deposit insurance in manifestation of moral hazard problem in CEE and FSU countries see Boot and Wijnbergen (1995, pp. 42-57).

The policies advocated for transition economies by the IMF and the World Bank and together termed as 'Financial Liberalisation', stem from the conventional view regarding the financial system inherited from a planned economy as inefficient and restrained. The majority of transition economies of CEE and the Baltics, and some of the FSU, introduced some measures of Financial Liberalisation at a relatively early stage of the transformation process. In this regard, despite the fact that some elements attributed to financial repression (interest rate ceilings, directed credits, high reserve requirements) were present in all transition economies at the beginning of transformation and in the pre-transition period, the short length of the dataset and its dubious quality limit the empirical analysis of the impact of the existed restraints on financial sector's performance across the region.

However, the McKinnon-Shaw framework can still be applied in studying individual cases of transition economies, experienced financial repression, such as, for example, Belarus. In fact, on the basis of chapters 3 and 4 some commonalities can be identified between developing countries and transition economies in their experience of financial development, particularly in the implications of some economic policies.

First of all, in both developing and pre-transition countries financial systems are labelled as underdeveloped and inefficient in the mainstream economics literature (see for example, McKinnon, 1993). It finds its confirmation in the set of policies prescribed to them in a form of financial liberalisation.

Second, financial systems in both groups of countries are dominated by commercial banks; capital markets are rather shallow and underdeveloped.

Third, a growing budget deficit was a typical problem in developing countries (and it remains so in many developing countries), as well as in transition economies[32]. Thus, it was common for governments of these countries to use implicit forms of taxation through introducing low interest rates, high reserve requirements, requirements obliging banks to hold government securities (all attributes of FR as defined in chapter 2), or to resort to inflationary financing (the tax itself is termed inflation tax) to offset revenue losses from direct taxes (see chapter 7).

Fourth, the use of other financial restraints such as administratively fixed exchange rate, capital controls was also usually common for both groups of countries to complement the above mentioned policies to prevent inflows of foreign capital.

[32] As evidence shows, the rates of budget deficit are not so high in transition economies as compared to developing countries, but it common for them to have quasi-budget deficit along with budget deficit.

Fifth, as a rule these countries (mostly FSU countries excluding the Baltic countries) are characterised by pervasive government intervention in the economy, although it should be admitted that extent of intervention varies from country to country.

Sixth, although present in developed economies, information imperfections are more typical of developing economies and transition economies. With the presence of a great degree of uncertainty in situations of economic liberalisation (transformation) of their economies, they become prone to market failures and therefore implementation of some neo-liberal polices can lead to very controversial results, as it was seen in sections 3.2 and in 4.3.

Seventh, some of these countries are lacking of democracy. They are keen on introducing financial repression to ensure the survival of dominant political elites. The opposite is also true. The political change towards democracy is more likely to trigger economic liberalisation[33].

All this gives us an impetus to progress analysis of financial development in transition economies within FR framework and turn to examining the case study of Belarus.

[33] For an excellent discussion of political economy of financial policy in developing countries, see Lukauskas (1994, pp.67-89), Haggard et al. (1993), Haggard and Webb (1993), Haggard and Kaufman (1995).

Chapter 5 The Origins and Context of Financial Repression in Belarus

Chapter 4 reviewed the existence of significant correlation between financial repression and political developments in transition economies. The present chapter starts by unveiling the origins of financial repression in Belarus. It shows that the political institutional change in Belarus in 1996 has spread to the areas of economic activity through the complementarity effect. In other words, the authoritarian governance has inflicted extensive state intervention into the economy, accompanied by the introduction of economic repressionist policies. Thus the decision to introduce financial repression in Belarus in the first place was determined politically, to assure the political viability of those in power. Section 5.1 concludes by looking at the basis of the Belarusian economic model to unveil the main leverages sustaining it.

Acknowledging the positive relationship between financial deepening and growth, it urges us to place the analysis of the developments in the financial sector at the centre of the analysis of economic policy-making in Belarus. In section 5.2 I present the developments in the financial sector in Belarus during 1990s in order to distinguish the key features of its evolution over the years of transition and to establish in what way the introduction of financial repression may have contributed to the economic recovery in Belarus. Analysis of the developments in the financial sector helps us to create a comprehensive picture of the degree of FR in Belarus and to formulate some hypotheses about its impact on the economic development in Belarus that are further tested in chapters 6 and 7.

5.1 Economic Policy and Performance in Belarus: the Context for Financial Policy

5.1.1 Politicisation of Economic Policy-making in Belarus

Under the Soviet system Belarus was the 'industrial assembly plant' specialising mainly on the production of complete goods. The share of industry in GDP in 1990 accounted for 49 per cent versus 22 per cent for the share of agriculture and 29 per cent for the share of services (Bakanova et al. 2003, p.8). The military-industrial complex accounted for more than half of industrial production. The peculiarity of the price-setting

mechanisms of the FSU resulted in price distortions, which favoured overpricing finished goods underpricing raw material and agricultural products, giving Belarus a positive trade balance within inter-republican trade. So, despite of the lack of natural resources Belarus' economically favourable position within the Soviet Union allowed it to have standard of living well above almost all CIS countries (see, for example, World Bank 1997, 2002 and Silitski 2002b).

However, despite the favourable initial conditions, Belarus would nevertheless have faced a sharp trade contraction and output decline if it had embarked on radical transformation in 1991. Belarus was highly dependent on trade that was a consequence of its industrial development. Total and intra-republican trade accounted for 47.3 per cent and 41 per cent respectively of Belarus' GNP. This was one of the highest figures across the whole region. Thus, the costs to Belarus of disruption of the trade links with other FSU republics due to their reduced demand after the collapse of the SU were estimated at 52.9 per cent of the Net Material Product, and this was also viewed as the highest amongst the Soviet republics (Bakanova et al 2003, p.9). Moreover, inevitable surge in prices of oil and gas after the collapse of the SU would have triggered a further output fall taking into account that Belarus was dependent on the FSU for 90 per cent of energy and 70 per cent of raw materials (World Bank 2002, p.1).

For further analysis it will be useful to distinguish the following periods of economic policy-making in Belarus.

➢ 1991-1993: 'Preserving the Status Quo' Policy

After the dissolution of the Soviet Union, the Belarusian authorities represented by the remnants of the Communist elite, so-called nomenklatura, were neither ready for a radical reformation of the country, nor expressed their willingness to do that. They were rather keen on preserving 'the status quo as a substitute for reforming the national economy' (Silitski 2002b, p.226). The strategy of the Belarusian authorities at that time was to preserve the arrangements within the single Rouble zone, trade links with Russia and also to assure the supply of Russian oil and gas at a price that existed on the Russian internal market. This helped Belarus avoid the early sharp transition decline in production[1] that was typical of the region, and guaranteed a temporary political survival for the Belarusian leadership. The initiation of integration discussions with Russia by

[1] The output decline in Belarus was recorded as the lowest one among the CIS countries, literally accounting for 3 per cent in 1990 and 1.2 per cent in 1991 (Bakanova et al. 2003, p.15).

Kebich[2] in 1993 was determined by the chosen 'populist strategy'[3] (discussed below) aiming to win the favour of a population that felt nostalgia for the Soviet Union and represented the majority of the electorate in 1994. Moreover, lobbying for this issue together with the achieved trade-offs between Russia and Belarus in other areas of cooperation[4], allowed the Belarusian nomenklatura to avoid reforming the economy due to the economic concessions gained from Russia (Korosteleva 2004).

Despite undertaking the measures described above to prevent a sharp decline in output, Belarus nonetheless went into a transition recession. Kebich's government responded to it with the macroeconomic expansionary policies aiming to minimize the social cost, that is to prevent a decline in real wages and employment. Namely, directed credit programmes were to target the output decline; social guarantees and control of consumer prices acted as pillars to prevent the decline in income. However, the expansionary policies put pressure on inflation, which averaged 2,000 per cent per year in 1993-94, and damaged the situation in the real economy, with the output decline reaching about 40 per cent for the period 1990-1995. On the eve of the 1994 presidential elections Kebich's government had lost its political standing due to the worsening of the macroeconomic situation and declining living standards.

➢ 1994-1995: Fragmentary Market Reforms

Immediately after Alexander Lukashenko's accession to power in 1994, there can be observed some changes in the economic policy-making in Belarus. This period was characterised by the introduction of some steps towards market-oriented reforms. With Bogdankevich, a neo-liberal economist, as head of the National Bank of Belarus (NBB) 1994-95 monetary policy was tightened and real interest rates made positive. However, all these observed positive changes in the economic policy-making in 1994-95 were not due to the adherence of Lukashenko's government to market-oriented reforms, but rather were due to the inevitability of initiating them in view of the continued worsening of macroeconomic situation and the frozen relations between Belarus and Russia. Indeed, at the beginning of Lukashenko's leadership a cooling in Moscow-Belarus relations could be observed. Lukashenko appeared on the political scene as an outsider,

[2] Kebich was Prime Minister from 1990 to 1994 and a presidential candidate in 1994.

[3] Silitski (2002a, p.35) defines the populist strategy as one in which the focus is placed on 'income increases ignoring the risks of inflation and budget deficit, external factors and reaction of economic agents on an aggressive anti-market economic policy'.

[4] For example, in September 1992 there was signed an agreement on military co-operation of Belarus with Russia, which extended the stay of Russian troops in Belarus until 2000.

and that made Moscow suspicious of him. The prospects of monetary union and subsidized energy supplies became doubtful, as Russian officials openly declared that the promise of both were made in anticipation of the election of Kebich as President, and were conditional on the eventual political unification, which Lukashenko was not yet ready to pursue (Silitski 2002b, pp. 229-230). That is why during 1994-95, just after his election, Lukashenko seemed to have given up almost all his electoral promises of maintaining the price controls and reintegration with Russia, and switched to a more radical course of economic transformation through tightening credit-monetary policy, cutting subsidies to some state enterprises, and partly liberalising prices. However, a further deterioration in the economic situation in Belarus would have undermined his popularity and triggered Lukashenko's turn towards Russia for a political and economic support. Although 1994-95 was a kind of watershed between an uneven and chaotic Kebich's policy and, the more system-defined policy of Lukashenko, it can still be regarded as a poor attempt to stabilize the economy, because it did not involve any in-depth transformation as such. The progress in transition after 1995 became rather slow, and this found its reflection in the decline of the average EBRD transition indicators from 2.1 in mid-1995 to 1.5 in mid-2000 (Bakanova et al. 2003, p.16).

- **1996-2000: Economic Repression**

1996-2000 was marked by a reversal of the political-cum-economic course and the introduction of the elements of the repressed economy. Table 5.1 gives some indication of the change in the degree of economic freedom in Belarus since 1996, compared to other transition economies. Following the results presented in the table Belarus had the worst ranking (with the exception of Turkmenistan and Uzbekistan) amongst transition economies in 1996-2002. It falls within the category 'repressed', whereas its neighbours Ukraine and Russia have made some progress in transformation, and, respectively, since 1996 they have been categorised as 'mostly unfree' rather than 'repressed'.

The strategy pursued by Lukashenko (discussed below) managed to produce economic growth from 1997, but its sustainability in the long run could be questioned.

Country	2002		2001		2000		1999		1998		1997		1996	
	OS	Rank out of 155	OS	Rank out of 155	OS	Rank out of 161	OS	Rank out of 161	OS	Rank out of 156	OS	Rank out of 150	OS	Rank out of 140
Hungary	2.2	24	2.4	36	2.4	31	2.9	55	2.9	56	3.1	69	3.0	58
Poland	2.7	44	2.7	50	2.8	52	2.8	50	2.9	54	3.1	71	3.3	75
Slovak Republic	2.8	54	2.9	58	3.2	80	3.4	96	3.3	89	3.2	72	3.1	64
Estonia	1.7	3	1.9	8	2.2	21	2.3	26	2.4	29	2.5	30	2.4	23
Latvia	2.5	36	2.4	38	2.7	44	2.7	47	2.8	49	2.9	53	3.2	69
Lithuania	2.4	30	2.5	39	2.8	52	2.9	56	3.0	63	3.1	70	3.5	84
Belarus	**4.2**	**145**	**4.1**	**141**	**4.2**	**141**	**4.2**	**140**	**4.2**	**134**	**4.0**	**126**	**3.5**	**84**
Moldova	3.3	88	3.7	118	3.3	92	3.4	100	3.4	96	3.6	103	3.5	84
Russia	3.7	125	3.8	127	3.8	121	3.6	114	3.5	103	3.8	119	3.7	104
Tajikistan	4.1	142	4.2	143	4.2	140	4.1	138	4.3	138	N/a	N/a	N/a	N/a
Turkmenistan	4.4	149	4.4	147	4.4	148	4.4	147	4.5	145	N/a	N/a	N/a	N/a
Ukraine	3.8	132	3.9	128	3.7	119	4	127	3.8	120	3.8	116	4	122
Uzbekistan	4.3	148	4.6	149	4.5	153	4.6	153	4.7	148	N/a	N/a	N/a	N/a

Table 5.1. Economic Freedom in selected transition economies[5]

[5] O'Driscoll et al. 2002. Note: OS denotes overall score that is an average of 10 factors measuring economic freedom. According to the Heritage foundation economic freedom is defined as 'the absence of government coercion or constraint on the production, distribution, or consumption of goods and services beyond the extent necessary for citizens to protect and maintain liberty itself' (ibid). The measure of economic freedom includes: trade policy, fiscal burden of government, government intervention in the economy, monetary policy, capital flows and foreign investment, banking and finance, wages and prices, property rights, regulation, and informal market activity. Indictors range from 1 to 5, where 1-1.99 means 'free', 2-2.99 – 'mostly free', 3-3.99 – 'mostly unfree' and 4-5 – 'repressed'. Scores are rounded to one decimal place.

5.1.2 Whither the 'Belarusian miracle'?

The case of Belarus is particularly intriguing because despite undertaking no transformation per se, and achieving no macroeconomic stability, Belarus has nevertheless demonstrated macroeconomic growth from 1997 onwards comparable to that in the Central European transition countries regarded as successful in transition. Inflationary creation and state stimulation of demand through policies of an unprecedented credit expansion, negative interest rates, and administrative price control seem to contribute to economic growth from 1997 onwards.

Admitting a decrease in aggregate demand as one of the factors of output decline, the government stressed the strategy of state stimulation of demand through policies of an unprecedented credit expansion and negative real interest rates as central ones in achieving the economic growth. However, it was difficult to implement them unless government had a high control over the economy. The state control could be easily established through preserving and increasing the state ownership. It became possible due to the reversal of privatisation programme[6]. In 1995 privatisation became rather artificial that presupposed turning the state enterprises into joint-stock companies with the state share prevailed or being more than 25 per cent that meant preserving the state control over the managerial decisions. That was strengthened by the 'golden share' right introduced by the government in 1997[7]. This granted unlimited right to the state to revoke any managerial decisions of joint-stock enterprises with state-hold stakes. The slow progress in privatisation in the beginning and its reversal later on explains low private sector share of GDP in Belarus, accounting only for 20 per cent compared to 60 per cent in Ukraine and 70 per cent in Russia (EBRD 2001)[8]. State control had also to be introduced in the financial system. It was literally done through the re-nationalisation of the banking system in 1995-1996. Moreover, it required the National bank to be subordinated to the government. All these issues will be considered in more details in the next section.

Declaring a socially-oriented market economy as a key direction of the economic development of Belarus, Lukashenko had all the instruments to manage his

[6] Privatisation in Belarus was primarily in a form of management and employee buy-outs (MEBOs) and secondary - voucher based (EBRD 2001, p.120).

[7] Presidential Decree 'On a special right ('golden share') of the state in share in management of joint-stock companies', No.591 (14 November 1997) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).

[8] It should be noted that this figure is likely to be underestimated as it does not account for contribution of the shadow economy.

policy. First of all, due to the set of policies described above the Belarusian economy achieved an astounding 11.4 per cent rate of economic growth and in general economic performance improved (see table 5.2).

Indicators	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
GDP	-7.6	-13	-10.4	2.8	11.4	8.4	3.4	5.8	4.7	5
Industrial production	-9.9	-19	-11.7	3.5	18.8	12.4	10.3	7.8	5.9	4.5
Agricultural production	1.5	-14	-4.7	2.4	-5.4	-0.7	-9.3	9.3	1.8	.7
Construction	-15	-11	-31	-5	20	25	-8	2	-3	6
Consumer prices	1190.2	2221	709.3	52.7	63.1	181.7	251.2	107.5	46.1	34.8
Real household income	16	-9	-34.9	13.5	17.5	27.5	-3	13.8	28.1	4
Real wages	-6.5	-31	-5	5.1	14.3	18	7.3	12	29.6	7.9

Table 5.2: Selected economic indicators for Belarus, 1993-2002[9]

The grounds for the economic growth were the reintroduction of the mechanism bearing a strong resemblance with a planned economy[10]. State ownership, lax credit, price controls and output targets – they all recognised as the elements of administrative planning economy. While the mechanism of resource allocation based on channelling the funds from those having a surplus to those having a deficit was typical in the Soviet economy, in the Belarusian economy it was realised not only through the directed credits supplies to preferential sectors of the economy, but also through such indirect instruments as relief from paying some taxes and customs duties by the 'strategic' sectors of the economy at the expense of increasing tax burden on a private sector, licensing of certain economic activities that aimed to crowd out the potential competitors from the market, rationing access to cheap natural resources, multiple interest rates, multiple exchange rates, restrictions in foreign exchange markets and price distortions. It is fair to note that restrictions in foreign exchange markets and price distortions were also exercised in a planned economy to large extent. However, what is remarkable is that under the Soviet economy all the enterprises were relatively equal in terms of their eligibility to subsidies upon the condition of running deficit, while in the present system the preferences have been given to strategic state-owned enterprises that

[9] Ministry of Statistics and Analysis 2002, 2003.
[10] See for example Nuti 1999, Lawson 2002, Bakanova et al. 2003.

in the end have been supported at the expense of the private sector, the households and the financial system.

Lukashenko's strategy succeeded. The measures introduced facilitated an increase in short-term living standards that raised Lukashenko's popularity among the Belarusian people. World Bank (2002, p.4) estimated that at the international yardstick of USD 4.3/day 'only about 10 per cent of the Belarusian population was to be considered poor in 1999, compared to 50.3 per cent in Russia or 18.4 per cent in Poland'. TACIS 2000a reported that since 1995 the number of people below poverty line[11] had been steadily declining until 1999 when it surged again in the aftermath of the Russian crisis, although still remained relatively low compared to Russia (see the WB estimates above). On pursuing the strategy of maintaining full employment, Lukashenko banned layoffs in the industrial sector (Silitski 2002a). The system of social support was largely based on price control for basic food, housing and communal services (all attributes of a planned economy). Moreover the state directed banks to provide wage credits to enterprises to assure timely wage payments to employees. Periodic increases in nominal wages and subsidies to poor people were also used to target the social sector.

The policy of money-led stimulation of the aggregate demand triggered the surge in households' consumption and investment in 1997 (see table 5.3).

Years	Real GDP growth	Consumption of private households	Government purchases	Investment in fixed capital	Net exports
Percentage change over the previous year					
1996	2.8	5.7	-1.3	-3.1	-4.1
1997	11.4	11.4	7.1	20	-5.9
1998	8.4	14.1	6	24.5	-4.9
1999	3.4	9.5	5.6	-11.1	-2.4
2000	5.8	8	6.6	-0.9	-3.2
2001	4.7	17.9	1.8	-6.5	-3.6
2002	5	9.3	1.8	3.2	N/A

Table 5.3: GDP by final sales, 1996-2002[12]

[11] The Minimum Subsistence Level (MSL) that was used as a proxy for 'poverty line' indicator, was set at the level of 60 per cent of Minimum Consumer Budget (MCB). As at 2002 30.5 per cent (versus 38.4 per cent in 1995) of the population was registered with income below the subsistence level (Haiduk et al. 2004, p. 130).

[12] Haiduk et al. 2004, p. 37.

rescheduling debts and extending the term the real amount of bad debts this is even higher than reported.

Years	Outstanding credits (end of period) as a % of total credits
1995	13.06
1996	16.24
1997	15.17
1998	19.18
1999	14.47
2000	11.3

Table 5.5: Bad loans as a percent of total loans[30]

In summary, assigning the central role in maintaining the Belarusian economic model to the banking system, the government halted the reforms in the banking sector and declared its intention to reinforce state control over banks. Re-nationalisation of specialised banks, subordination of the National Bank to the government, centralisation and state monopolisation of the banking system made the latter impotent and turned it into a tool of serving the government needs.

5.2.1.2 Capital Markets

Between 1992-94 a base was created to build up the system of capital circulation in Belarus, involving both domestic and foreign investors. Thus, the Belarusian Stock Exchange was founded in November 1991 and later on, in March 1993, the Minsk Interbank Currency Exchange was established. Straight after that the authorities created State Securities Inspectorate, which was in charge of setting up the rules in securities market, developing legislative base and protecting investors from fraud. However, after 1995 further development of the capital market slowed, due to the sluggish restructuring of the national economy, and the re-introduced pervasive state control over all economic activities. The latter resulted in the nationalisation of the Minsk Interbank Currency Exchange in April 1996 and the followed unification of currency and stock exchanges with the consequent nationalisation of the Belarusian Stock Exchange[31] in July 1998.

[30] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January)).
[31] As a matter of fact, before 1998 60 per cent of the Belarusian Stock Exchange was in private hands (EBRD 1998).

The latter became subordinated to the State Securities Committee. Moreover, the number of official controlling bodies has increased twice since 1995, and that has often led to contradictions in the legislative basis for regulating the securities market.

Furthermore, development of the domestic capital market was inhibited by slow progress (often even by its reversal) in removing different types of capital and exchange rate controls. The latter were imposed on commercial bank borrowing (lending) at foreign capital markets, portfolio flows into equity, domestic money and government securities markets. Thus, restrictions on commercial bank borrowing were in place from December 1992[32]. Restrictions on portfolio inflows/outflows were in place throughout the whole period (for chronology see appendix B). Inflow of FDI became very limited after the reversal of privatisation programme in 1996-97. In aftermath of the Belarusian currency crisis in early 1998, and later in August 1998 financial crisis in Russia, wide-ranging controls, including on exchange rates and cross-border payments were re-introduced in Belarus. It should be noted that even with some fragmentary attempts to ease certain restrictions over the period of transition, general macroeconomic instability and an unfavourable business climate appeared as de-facto impediments for attracting private capital. FDI figures can be used here as an ad-hoc indicator of foreign investors' perception of political-cum-economic climate in Belarus. According to EBRD (2002) estimates, the cumulative FDI inflows per capita for the period of 1994-2002 amounted only to USD 145. Moreover, contradictory legislation has further aggravated functioning of domestic economic agents and has frightened off foreign companies expressing any initial interest in dealing with their Belarusian counterparts. From the beginning of transition the paradox of the Belarusian economic development lay in the authorities' anticipation of transition process in theory, but not in practice. Thus, for example, the early act[33] regulating investment activity of the Belarusian economic agents abroad seemed to be too radical, untimely and simply bizarre. Allowing Belarusian firms to invest in the equity market, trade in securities markets and buy land abroad was not an evidence of the authorities' commitment to market reforms. It was rather evidence of their incompetence and limited understanding of the transition process.

[32] In fact, Resolution of the Council of Ministers of the Republic Belarus No.518 (24 August 1992) (Konsul'tant Plyus: Belarus [CD-Rom] 2002) allowed both attracting loans from abroad at the level of the government and guaranteed by the government and at the level of commercial banks on behalf of their clients. The latter was excluded from the resolution when it was amended on 31 December 1992.

[33] See Resolution of the Council of Ministers of the Republic of Belarus 'On investment activity of the Belarusian agents abroad', No.324 (29 May 1992) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).

The Belarusian financial instruments (see below) appeared to be unable to provide investors with adequate return for the high risks borne by them in terms of contradictory legislation, low transparency of operations, high uncertainty, and inefficient control. The situation was also aggravated by a high level of inflation, continued devaluation of national currency, negative (loss-making) or low interest rates, and generally by high country and liquidity risks. Therefore the Belarusian capital market appeared to be unattractive to both internal and external investors due to a low risk-adjusted rate of return. Tables 5.6-5.7 present the structure and the turnout of the primary and secondary securities markets in Belarus.

Indicators	**1997**	**1998**	**1999**	**2000***
Total face value, bln. BRB	64852	101721	410464	N/a
Vouchers, %	50.21	46.60	11	-
Government Securities (GKO&GDO), %	16.75	23.03	22	22.40
Municipal Bonds, %	0.16	0.34	1	0.34
Corporate Securities, %	26.53	24.4	25	37
Promissory notes, certificates	6.35	5.63	41	40.26

Table 5.6: Structure of the primary government securities market[34]

Indicators	**1997**	**1998**	**1999**	**2000***
Turnout, trln. BRB	155.54	225.88	1175.32	3820
Vouchers, %	0.0	0.0	0.0	0.2
Government Securities (GKO & GDO), %	96.1	93	77	76.34
Municipal Bonds, %	1	1.4	N/a	N/a
Corporate Securities, %	0.7	2.9	0.7	0.46
Promissory notes, certificates	2.2	2.7	21.4	23.15
Others	-	-	0.2	0.03

Table 5.7: Secondary market: turnout[35]

The securities market was mostly represented by the government securities such as treasury bills (GKO's), which along with credit emission were one of main methods of financing the government deficit and were the most liquid financial instrument, and long-term liabilities (DGO's) for up to 3 years. Belarusian banks were highly exposed to GKOs because the choice of other financial instruments[36], when banks had excess liquidity, was limited. GKOs had relatively high nominal yield and they were tax-exempted. According to the Belarusian regulations, the yield on GKOs on the primary

[34] Novik (2001, p. 26). An asterisk denotes 'excluding vouchers'.
[35] ibid, p. 27. An asterisk denotes 'includes data for 9 months of 2000'.
[36] For example, NBB securities and deposits with NBB

market was strictly pegged to the refinance rate, which in most of the late 1990s was negative (see figure 5.5). At the same time they bear less risk than when lending to enterprises that often occurred at 'favourable rates', which as a rule were half of refinancing rate. That is why GKOs were more attractive for banks. Moreover, to some extent banks' exposure to GKOs was attributed to the existing practice of imposed mandatory acquisition of GKOs by banks. Thus, 'commercial banks' licensed to operate in the primary GKOs were each obliged to buy 1 per cent of each GKOs issue (TACIS 2000a). Finally, since 1997 the allocation of loans amongst banks at auctions[37] has de-facto been replaced with new instruments of banks' refinancing, one of each was the use of 'repo' operations[38]. That has triggered some revitalisation of GKOs since 1997. However, it should be noted that in comparison to its neighbours, Ukraine and Russia, the volumes of GKOs issued in Belarus have remained low. As of the end of 2000 capitalisation of government securities market at face value accounted only for 1 per cent of GDP (Novik, 2001, p.30). Figure 5.2 shows the capacity of the government securities market (primary) during 1998-2000.

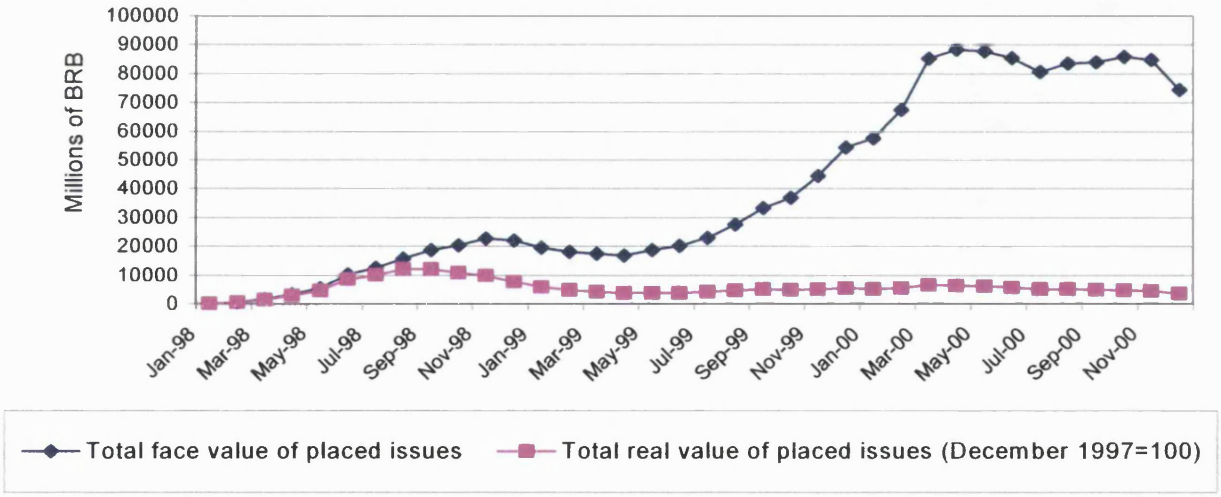

Figure 5.2: Government securities market (GKO & GDO)[39]

[37] Its share in refinancing has reduced drastically since 1995 and in relative terms remained very little, accounting, for example, in December 1999 only around 3 per cent (TACIS 2000a).

[38] 'Repo' operations are meant to be a form of loan to commercial banks (CBs) upon the NBB's purchase of government securities from CBs with a promise by the latter to buy these securities back after some specified period.

[39] The figure is drawn on the data derived from Novik 2001, p.29.

As one can see both volumes of placed issues at face value and in real terms exhibit an upward trend till August 1998, afterwards they drive apart with the latter decreasing. As of the end of 2000 the total volume of government securities (GKO and GDO) in real terms was accounted only 30 per cent of its level in August 1998. This downward trend can be primarily attributed to the consequences of financial crisis in Russia at the end of August.

Other securities include municipal bonds, used to raise funds for housing construction. The first issue of municipal bonds was launched in 1993. The authorities failed to raise the planned funds. TACIS (1997) reported that 'out of 2250 bonds, only 41 were sold, whilst the remainder were given to the NBB as the collateral for the USD1 mln. loan'. The second attempt of issuing Minsk Housing Bond Loan with a maturity of 32 months was undertaken in 1996 and in spite of low coupon rate equal to 1/18 of the refinancing rate, it proved to be more successful than the first attempted, raising nearly BRB 480 billion. Afterwards, the government started to promote it further in the regions. However, it should be noted that the future of the Municipal Bond scheme is not so optimistic due to 'low transparency of the issues, lack of unbiased information and insufficient guarantees for potential investors' (see TACIS 1997, 2000a). With the low paying capacity of the population in Belarus, apartments have turned out to be a very illiquid asset. Moreover, because normally potential investors get only a 'certain amount of square meters' (not a whole apartment) as collateral, it will be particularly hard for them to sell these 'certain amount of square meters' if it comes to the point of turning collateral into cash.

Corporate securities – mostly shares in privatised enterprises- are weakly developed. The Head of the Department of Foreign Exchange Operations in Belarusbank commented that 'the corporate market is rather dead. It amounts to around 3-4 transactions per month' [40]. Following the estimates of TACIS (2000a) total number of transactions of corporate securities at the Belarusian Currency Stock Exchange (BCSE) was 114 in 1998 and only 36 for 11 months of 1999. Their share's stability in total volume of the issued securities in Belarus in 1997-1999 (see table 5.6) is only attributed to the constant revaluation of fixed capital of enterprises that in turn increases the stock's face value. The increase in the share of corporate securities in 2000 occurred due to the new requirement for banks to increase their statutory funds (see above). Slow

[40] Interview with the Head of the Department of Foreign Exchange Operations in Belarusbank, conducted on 6 February 2002 during fieldwork in Minsk.

progress in the development of a corporate securities market can be explained by a number of reasons, one of which is that privatisation as such did not happen, and that potentially excluded any possibilities of the existence of a private securities market. However, at the same it has given more room for manoeuvre to the government, for increasing its gains from seigniorage.

To summarise, we can conclude that the capital market in Belarus is very shallow and can barely be considered as playing any role at all in enterprises' financing. Belarus in comparison with most of the other transition economies has achieved little progress in both reforming its banking sector and developing its capital markets. Its pattern of financial development is solely bank-based, while in other transition economies the role of capital markets in financing enterprise activities has been increasing over the years of transition. Moreover, banking activity itself is highly restrained by the government and therefore lacks autonomy and manoeuvre that was typical of many developing countries that at times pursued financial repressionist policies.

5.2.2 Financial Developments

5.2.2.1 The History of Monetary and Credit Policy in the 1990s

The key issue for the Belarusian authorities at the beginning of transition was to preserve the rouble zone that replaced the Soviet system and was supposed to help in creating a common economic space throughout the CIS. The Central Bank of Russia had a monopoly on currency emission within the rouble zone but the central banks of other CIS countries were allowed to issue credits to enterprises, or to cover budget deficits. This created massive opportunities for free-riding on Russia's efforts at economic reform, and was a system of transfers from Russia to other states. The governments and national banks of smaller Soviet republics could afford an uncontrolled emission of money as inflation effects were spread widely throughout the post-Soviet space. Its free rider status allowed the Belarusian government to print enough money to pay wages and credit state companies and collective farms (*kolkhozy*) while suffering only a small inflationary impact. The effect of these policies was a large transfer of wealth from Russia to Belarus, equivalent to 13 per cent of its GDP in 1992

and 8 per cent of its GDP in the first seven months of 1993 prior to the final break up of the rouble zone[41].

At the same time, as Russia attempted to restrict the supply of money in early 1992, the deficit between cash and non-cash money in Belarus began to increase[42]. In May 1992 the shortage of cash money triggered the introduction of Rouble supplement, the Belarusian Rouble, known as '*zaichik*', or hare, because of the hare depicted on the first rouble banknote. The value of banknotes was rising with rising size of animals. Starting with a squirrel equal to fifty kopeck, it ended with a buffalo equivalent to a thousand roubles. Someone has made a good joke on this account. 'With hyperinflation Belarusians began to run out of big animals. Even the blue whale was not big enough, so they started to print pictures of official buildings'.

Non-cash *zaichik* was converted at a rate 1 to 5 against non-cash Russian Roubles, whereas the banknotes were exchanged at a rate 1 to 10. These variations in rates created favourable conditions for highly profitable speculative activity. One cycle of converting non-cash Russian rouble credit into non-cash *zaichik* then into *zaichik* banknotes (at par) and trading the latter for cash Russian roubles (at a rate 1 to 10), which in the end were exchanged in Moscow for 1.3 times as many non-cash Russian roubles, produced a 50-70 per cent profit (Conway 1995, p.49).

The economic impact of the rouble zone on Russia meant that it could not be maintained forever. Russian monetary reform in July 1993 and inflationary pressures on the exchange rate parity between *zaichik* and the Russian rouble put the end to the rouble zone and forced Belarus to announce the Belarusian rouble as the only legitimate means of payments in 1994 (Lisovskaia and Korosteleva 2002). As a consequence of the policy of money emission levels of hyperinflation rocketed from 1,560 per cent in 1992 to 2,221 per cent in 1994.

Some efforts were made from 1995 to control inflation and stiffen monetary policy. The policy of positive real interest rates was declared. Indeed as one can trace from figure 5.6 (section 5.2.2.2) positive real rates were set in 1995 and maintained till September 1996, which at the same time were accompanied by a sharp fall in money growth in 1995. Moreover, by the end of 1994 a fixed exchange rate appeared to be the anchor of stabilisation policy. These measures were very effective in terms of curbing

[41] Silitski 2002b, p.225.

[42] Belarus became experiencing the shortages in the spring of 1992 and later in May and June of 1993. Shortages gave a rise to a premium in the informal trade of cash for non-cash balances. According to Conway (1995, p.29) 'obnalichka' dealers charged a 30 per cent fee to convert bank credits into cash.

inflation, which was brought down from 4-digit rate in 1994 to 2-digit rate in 1996. However, as one may note, monetary policy tightening was the main instrument for curbing inflation. Indeed, the correlation between rouble money growth and inflation is obvious, and though it cannot be clearly captured by the simple graph, it still can be observed (figure 5.3).

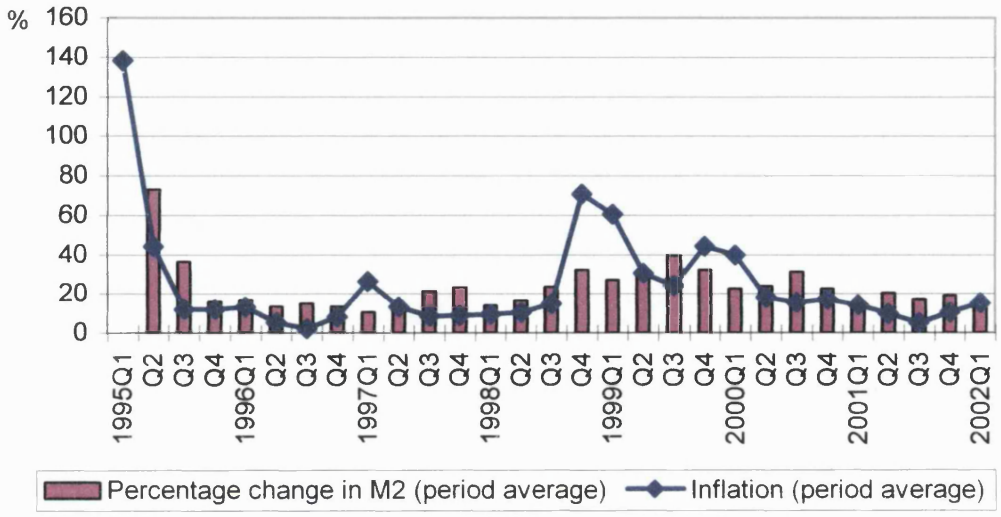

Figure 5.3: Inflation and percentage change in broad rouble money (M2)[43]

In fact, they seem to go in line until the middle of 1996, afterwards there can be observed a time lag between them. Indeed, after performing the simple correlation analysis, inflation appears to be more highly correlated with the second lagged value of M2. By mid-1995 most prices had been liberalised, and that explained the clearer pattern between the two trends in 1995-beginnning of 1996. Afterwards, inflation became largely underestimated due to the re-imposed price controls. However, under increasing pressure of inflationary expectations on the market BRB/USD exchange rate, the authorities could not keep prices under control and had to periodically adjust them. This, in fact, explains how a time lag occurred between rouble monetary growth and inflation after 1995. At the end of 1998 M2 increased only by 30 per cent while inflation rocketed to 70 per cent in the fourth quarter of 1998. The latter can be explained by the adverse impact of the financial crisis in Russia in August 1998. The Belarusian rouble (valued at the market BRB/USD exchange rate) was devalued by more than 350 per cent in September-December 1998 (see figure 5.8). Moreover, in

[43] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003).

light of the Russian financial market collapse, the Belarusian authorities trying to prevent speculations, introduced restrictions on payments in BRB, particularly in terms of transactions on correspondent accounts of non-resident banks (see appendix B) that created an additional pressure on the foreign exchange market triggering a further increase in the excess demand for foreign currency and the growing gap between the official and market exchange rates.

Proceeding further an examination of rouble money growth it is interesting to see if there can be observed any seasonal patterns in M2 behaviour. An in depth analysis of the behaviour of M2 is in figure 5.4, where 3-month average M2 growth is plotted. There is a sharp fall in M2 growth by the beginning of 1996, and that once again confirms the declared monetary policy tightening in 1995. During 1996-97 some seasonal trend similarities in M2 behaviour can be recognised during certain periods. M2 surges by the second quarter achieving peak values in the mid-year and slows down in October-December, which is in line with the expansion of directed credits granted to the main subsidised sector of economy, agriculture, for sowing in spring and for preparations and harvest collection in summer and early autumn.

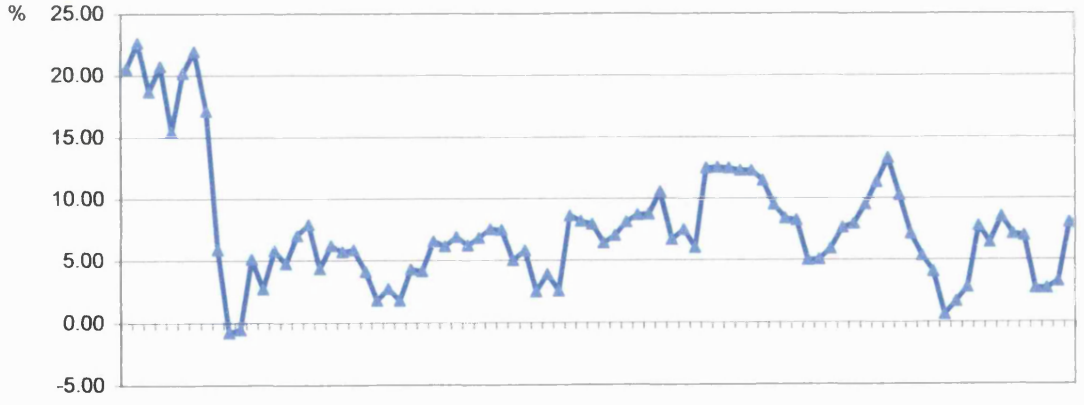

Figure 5.4: M2, percentage change (3-months average)

Another peculiarity in figure 5.4 can be observed after 1997, when a gradual upward shift of the graph heralds a more intensive monetary-credit expansion policy. Reintroduction of a stricter monetary policy at the end of 2000 leads to a significant decrease in M2 by the beginning of 2001. However, further follows its increase at the mid of the year, that can be explained by the preparations for 2001 president election campaign, and the expansionist policy of the government with this regard.

As observed from the graph, the deflationary policy, which began at the beginning of 1995, did not last long. The deterioration of the real sector of the economy, as a consequence of the tougher credit-monetary policy, led the Belarusian authorities to loosen monetary policy once more. The inability of the government to maintain its exchange rate commitments, because of insufficient foreign exchange reserves, led to devaluation of the Belarusian Rouble. From 1996 the country has turned back to implementing measures typical of a repressed economy, which are defined in the next section.

5.2.2.2 Financial Restraints

In section 5.1 a brief introduction to the Belarusian economic model of the late 1990s was given. The present section will focus on each government policy comprising the Belarusian model within the financial sector dimension in more details.

The main ideas which laid the basis for Belarusian economic development in the late 1990s, can be summarised as follows:

I. By disregarding the inflationary nature of money growth, the Belarusian authorities stressed the importance of revitalising the practice of lax credits to economic agents that were believed to facilitate increase in output, as the decline in it, according to them, was solely attributable to enterprises' shortage of money.

II. The NBB resorted to the policy of high reserve requirements in order to target excess liquidity as a result of expansionary monetary-credit policy. Moreover, higher reserve requirements could potentially increase the government's gains from seigniorage. In fact, there are two ways to increase seigniorage: either through increase in monetary growth rate or through increase in real monetary base (see chapter 7). Along with currency in circulation banks' reserves appear to be a component of monetary base, and therefore, a potential source for extracting seigniorage under the policy of high reserve requirements.

III Recognising the negative effect of high nominal interest rates on real sector developments (recall chapter 4) the government advocated introduction of the mechanism of administratively controlled interest rates that could make bank resources more accessible to enterprises.

IV. By seeing speculation as a driving force behind the BRB depreciation, the Belarusian authorities believed in their ability to ensure the BRB's stability by setting

the nominal exchange rate administratively and by restricting the access of non-critical importers to the foreign exchange market[44].

These ideas resulted in the implementation of four main repressionist policies, namely, directed credits and preferential loans policy with a view to advancing administrative reallocation of credit resources in favour of the branches of economy regarded by the Belarusian authorities as priorities; high reserve requirements; a policy of negative real interest rates; and a policy of multiple exchange rates, which all together were placed at the centre of the Belarusian strategy of economic development.

Directed credits policy

Although directed credits were continuously exercised from the beginning of transition, they were first officially defined in 1998 in the 'Main requirements for banks to use directed credits'[45]. Directed credits were accordingly defined as loans designed for mainly supporting the agricultural sector[46] and house construction. The traditional way of channelling these credits was through the SF banks, which were government agents in servicing social-cum-economic oriented programmes. Particularly, Belarusbank was mainly used in financing housing construction, and Agroprombank serviced the agricultural sector. The loans were channelled within open credit lines at interest rates varying between 2 per cent pa and 50 per cent of refinancing rate pa (for details see below).

The aforementioned document envisaged also the use of bank-agents or 'system-forming' banks in serving other governmental programs of 'high priority' on 'favourable terms'[47] at the expense of banks' own/attracted capital. However, in terms of constant liquidity problems of the banking system as a result of their financing of low-yield or virtually loss-making projects the NBB had to provide them with the necessary resources. Thus, financing with the use of banks' resources still to a great extent remained inflationary with the only difference that current banks' loans were financed by the followed (lagged) NBB emission. Moreover, this crediting practice was believed to hinder long-run economic growth as it diverted scarce credit resources from effective users, and to undermine banks' financial stability.

[44] Rusakevich 2002.
[45] NBB Resolution No.6.2 (11 February 1998) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).
[46] Loans for agricultural sector were usually issued for the purposes of forming state grain reserves; purchase and delivery of agricultural products, financing sowing/harvesting campaigns.
[47] The term 'on favourable terms' means that the lending interest rate was only half of the refinancing rate.

SF banks which are equipped with a public deposit insurance, small and medium-sized commercial banks (SMCBs) had to look for their own niches to work. Many of them have been claimed to service the shadow economy.[28] Foreign currency transactions and short-term lending on inter-bank market are other typical niches of SMCBs.

Domestic credit provided by the banking sector to the economy accounted for only 21 per cent of GDP in 2003, far below many CEE countries. A loose monetary-credit policy, aiming to keep real sector afloat, drained bank financial resources because many loans were never repaid and inflation eroded the real value of bank deposits and capital, thus leading to serious liquidity problems and undercapitalization of the banking sector. Priority financing of loss-making state-owned enterprises triggered problems of adverse selection and moral hazard. Thus, access to credit by 'good borrowers', who deserved to get it by all means and were ready to pay a competitive interest rate, was restrained by liquidity constraints and low capitalization of the banking sector. At the same time, state-owned enterprises, adhering to the idea that they are too big for the state to let them sink, took bank loans for granted, often failing to repay them and expecting new bank loans to bail them out.

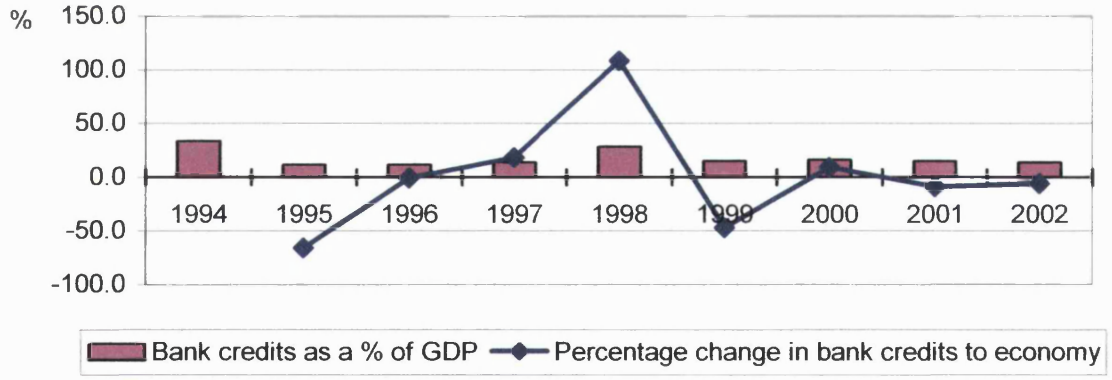

Figure 5.1: Bank credits as a percent of GDP[29]

The sustained policy of soft budget constraints and directed credits has aggravated the problem of bad debts and undermined solvency of the Belarusian banking sector. Overall, bad debts accounted for 11-19 per cent of total banks' credits (table 5.5) in 1995-2000 whereas according to the international standards their amount should not exceed 5 per cent. Since the Belarusian banks frequently exercise such practices as

[28] *Belaruskaya Gazeta,* No.8 [324], 25 February 2002, p.8.
[29] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003).

There exists evidence that many of the issued loans were not repaid on time and were always prolonged, often even without accruing interest during the period of loan prolongation. Thus, Presidential Decree No.96 (3 March 1998)[48] said that liabilities of collective farms (kholkhozy and sovkhozy), and other agricultural enterprises as of December 1997 were extended and due to be repaid from 1 January 2000 to 1 September 2000.[49] The same Decree authorised SF banks to issue new credits to these enterprises in 1998, which contradicted the aforementioned 'Main requirements for banks to use directed credits' (Korosteleva 2005). The latter says,

> 'Banks, defined to finance preparation and carrying out of sowing campaigns, issue short-term loans within credit lines open for these purposes by the NB RB to financially stable collective farms and other agricultural enterprises and organisations, which do not have over-due loans with the banks issued to them earlier'.[50]

Furthermore, Resolution of the Council of Ministers No.50 (15 January 1999) authorised the SF banks to prolong loans issued to the collective farms and agricultural enterprises up to September, 1999, without accruing interest on these loans for the period of loan prolongation. The authorities often 'requested' SF banks serving state programmes to forgive interest payments[51].

Banks' margins in connection with directed credits or preferential loans were often set within a 1-2 per cent limit. In this case, the concept of margin was practically meaningless as 1) it was negative in real terms and could not even cover banks' costs of serving credit; 2) as mentioned above, interest payments were paid occasionally (on loans to house construction and industry), if at all (as in case of agricultural sector); 3) as a matter of fact, these loans became outstanding as time went by and were rarely

[48] Konsul'tant Plyus: Belarus [CD-Rom] 2002.
[49] See also Presidential Decree No.351pn (10 December 1998) (Konsul'tant Plyus: Belarus [CD-Rom] 2002) that authorised postponing of repayment of loan issued to 'Orsha' enterprise at the amount of BRB 10.4 billion and the accrued interest until December 2001. With inflation of 969 per cent in 1999-2001 this sum was worth only BRB 973 million in 2001. Moreover, the repayment of this loan was not guaranteed yet in 2001. It was also very common of the Belarusian authorities to prolonging loan repayments endlessly until they were wiped off by inflation.
[50] Paragraph 1.1 of the 'Main Requirements for banks to use directed credits', No. 6.2, adopted by the NBB on 11 February 1998 (Konsul'tant Plyus: Belarus [CD-Rom] 2002).
[51] See for example Resolution of the Council of Ministers No.1417 (10 September 1998) (Konsul'tant Plyus: Belarus [CD-Rom] 2002), annulling the interest payments of 35 milliard BRB roubles accrued during 1995-1997 on loans issued to flax-scutching mills on buying feedstock.

recovered. In other words, these loans were potentially bad debts. In this case, the National Bank or the Ministry of Finance applied debts-for-equity swap schemes to these banks, by this increasing state ownership in them[52]. This action had another implication: it made these banks' performance look better statistically (because the percentage of bad debts was decreasing whilst capital increased), but in reality it was an artificial growth of capital (Korosteleva 2005).

These directed or emission credits as a way of the state reallocating financial flows, particularly via channelling credits directly from the NBB to commercial banks, can be regarded as quasi-budget expenses. This is why Belarus was among the limited number of post-communist countries that managed to keep its budget deficit at level less than 3 per cent of GDP.

Speaking about banks' refinancing mechanisms, it is interesting to note that while in 1995 80 per cent of the credits were reallocated through market actions[53], after 1996 they became allocated administratively. Following the NBB Regulation rules No.93 (23 August 1996)[54], banks were mainly refinanced at the interest rate set by the Council of Directors of the NB that depended on a official refinancing rate. The official rate was the announced refinancing rate, at which a small amount of the credit market had been served. The factual refinancing interest rate was in fact the rate at which the National Bank granted credits. As noted by Rusakevich (2002, pp. 19-20) this rate was composed of the following main interest rates:

1. A highly privileged rate on directed credits granted for housing construction programme. It was usually one tenth of the announced refinancing interest rate. With inflation between 63.9 per cent and 293.7 per cent p.a. in 1997-1999, this rate was only

[52] For example, Resolution of CM No.1563 (13 November 2002) (Konsul'tant Plyus: Belarus [CD-Rom] 2002) authorised recapitalisation of Agroprombank, one of the SF banks, through increasing the state share (Ministries of Finance and Agriculture) in its statutory fund. The same Resolution authorised the bank to finance purchase of agricultural machinery (loan to be granted for 6 years under 5 per cent pa.).

[53] Credit auctions first were introduced in 1993 (see Temporary Rules of Carrying out Credit Auctions approved by the NBB, No.1 (20 January 1993) (Konsul'tant Plyus: Belarus [CD-Rom] 2002). The volumes of loans allocated through credit auctions were set in Main Directions of monetary-credit policy for each year and were reconsidered quarterly depending on the tasks of liquidity regulation of monetary market. Following Regulation Rules adopted by the NBB, No.71 (5 May 1995) (Konsul'tant Plyus: Belarus [CD-Rom] 2002) under conditions of high inflation loans were issued only for 7 –14 days. Two types of auctions were envisaged: 1) "rate tender" – bids for fixed amount of money. All demands, starting with a tender offered the highest interest rate and ending with a tender who still fits the set credit limit, were satisfied; 2) at a single cutting off rate – the same procedure as in 1), but all demands were satisfied at a single cutting off rate

[54] Konsul'tant Plyus: Belarus [CD-Rom] 2002.

5 per cent pa[55] and credit was granted under the condition that it was to be repaid within 40 years[56].

2. A privileged rate on the majority of directed credits to agriculture. In 1997-2000 this was half of the announced rate.

3. The official refinancing rate which was mainly used as a rate of return on GKO of the first circulation.

4. Rates on market instruments of short-term financing (Lombard and overnight credits), which were, as a rule, higher than the announced refinancing rate. However, these rates were still administratively set by the monetary authorities and were not always much in excess of the official refinancing rate. Thus, for example, while the official refinancing was set at 36 per cent p.a. in September 1997, the Lombard rate was set in range of 40-45 per cent p.a. (see appendix C for chronology of interest rates controls).

The fact that the real factual refinancing rate was more favourable for banks than the real deposit rate (see figures 5.5 and 5.6) encouraged banks to appeal to cheap NBB credit resources[57] rather than to attract means of individuals and enterprises into deposits. Actually, the real deposit interest rates were not so high during 1995-96, and even negative afterwards, to activate the latter anyway.

Financing of priority enterprises by commercial banks 'on favourable terms' has particularly surged since 1999, after the Belarusian authorities expressed their intention to increase the use of commercial banks' resources in financing economic agents. In fact, the Belarusian official statistics suggest that, in 2000, directed credits to the house construction and to the agricultural sectors were fully replaced with preferential credits issued by commercial banks to the above sectors of economy. However, this did not change the heart of the problem much, as inflationary financing was still in place[58]. Therefore, the figures on direct credits presented in table 5.8 do not reflect the full

[55] Interest payments were envisaged to be paid only three years after the loan had been issued.

[56] When the house construction programme was launched in 1996 (Presidential Directive No.516 (22 December 1995) (Konsul'tant Plyus: Belarus [CD-Rom] 2002) loan was initially granted for 20 years. Since 2000 JSSB "Belarusbank" has been authorised to finance only 75 per cent (95 per cent still in rural areas) versus 90 per cent in 1995-99 of the cost of house construction for no more than 20 years (40 years in rural areas) under 10 per cent (5 per cent in rural areas) p.a.

[57] The NBB set refinancing limits every year for each bank individually. These limits were often reconsidered during each year always towards increase.

[58] There should be noted that over the recent years this practice has been gradually replaced with new, market-based, schemes of banks' refinancing, amongst which 'repo' operations and Lombard credits could be named. It has had positive effect on macroeconomic stabilisation.

extent of inflationary financing of the Belarusian economy as they do not count for preferential loans[59].

Share of each form of refinancing in total volume of refinancing, %	**1996**	**1997**	**1998**	**1999**	**2000**
Directed credits	65.3	53.5	58.7	45.1	0
including:					
house construction	N/a	25.7	32.4	33.9	0
agricultural sector	N/a	27.2	23.4	9.3	0
other				1.9	
Lombard credits	8.5	1	0	14.7	15.8
Overnight credits					37.4
Purchase of government securities (including 'repo' operations)	12.8	14.6	28.4	22.9	18.7
Swap transactions	13.4	29.9	11.3	15.1	5.3
Other forms refinancing	0	1	1.6	2.2	22.8
Total:	100	100	100	100	100

Table 5.8: Structure of banks' refinancing[60]

According to the NBB all forms of refinancing, excluding directed credits, are defined as market forms of refinancing. However, it is interesting to note that none of these credits were allocated on a market basis in the true sense of the word. Interest rates on all these loans were set administratively through the whole analysed period of time (see appendix C for chronology of interest rates controls).

Alongside directed credits and preferential loans schemes, the NBB continuously exercised monetisation of budget deficit[61]. In this regard it is interesting to compare figures on the NBB credits to the government with figures on the actual budget expenditures in part of supporting priority sectors of economy (agriculture, house construction and industry) and see to what extent the latter could potentially be covered by the NBB emission.

[59] Unfortunately, the lack of transparency in banking statistics does not allow collecting data on preferential loans.

[60] NBB material given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NB during our meeting in March 2003.

[61] As a matter of fact monetisation of government debt was banned in Russia since 1995, while in many CEECs – at a even earlier stage of transition.

	1996	1997	1998	1999	2000
Total expenditure, mln. BRB	63345.7	135865.3	249577.5	1142843	3181146
including:					
Agricultural sector	1996.0	4222.9	9799.0	37253.6	87050.9
House construction	2489.0	6133.9	13107.3	81387.7	248081.6
Industry	675.4	1730.4	3747.9	20409.9	34735.6
Budget deficit/surplus	-3645.9	-6738.5	-9995.5	-87935.7	-1747.3
Total expenditures on the aforementioned budget articles, as % of total government expenditure	8.1	8.9	10.7	12.2	11.6
NBB financing of government deficit (plan)	1860.00	3375.0	6075.3	28700	75875.9
NBB financing of budget deficit (actual)	7484	12437.9	48440.7	138682.7	261058
Percentage change in government financing by NBB		66	289	186	88
Total expenditures on the aforementioned budget articles, as % of NBB financing (actual)	69	97	55	100.3	142

Table 5.9: Actual government expenditures in part of financing agricultural sector, house construction and industry[62]

In fact, conceptually there was not much difference between loans granted to the government to finance priority sectors of the economy and the NBB directed credits. The National Bank issued loans to the Ministry of Finance, which in turn reallocated them between the SF banks. It is also worth noting that from 1999 it has was very common for SF banks to finance 'strategic' enterprises at the factual refinancing rate and for the government to compensate half of the refinancing rate due to be paid by 'strategic' enterprises to banks. In fact, this compensation was meant to be paid from the Republic's budget (section on 'Subsidies to state enterprises and organisations and other subsidies'). A similar financing scheme, introduced around the same time,

[62] Author's calculations on the NBB data (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003). Figures on NBB financing of budget deficit were derived from the Law 'On Budget of the Republic of Belarus for 1996', No. 279-XIII (19 April 1996), the Law 'On Budget of the Republic of Belarus for 1997', No. 20-3 (21 February 1997), the Law 'On Budget of the Republic of Belarus for 1998', No.107-3 (29 December 1997), the Law 'On Budget of the Republic of Belarus for 1999', No.245-3 (24 February 1999), the Law 'On Budget of the Republic of Belarus for 2000', No.367-3 (31 January 2000) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).

envisaged compensation of 50 per cent of the refinancing rate to SF banks (also to be paid from the Republic's Budget) that issued loans to 'strategic enterprises' at half of the refinancing rate.[63] Compensation was not given on a regular basis.

Because of low capitalisation of the banking system[64] and the enormous investments that some projects required (for example, to finance capital renewals in oil refinery companies in Mozyr or a potassium company 'Belaruscalii'), the authorities often authorised more than one SF bank to participate in the financing of these projects. These loans were called consortia loans and they were mainly denominated in foreign currency under government guarantee. What was special about these loans was that the government guarantee, in fact, meant loan repayment in BRB at the official exchange rate that was around 60 per cent lower than the market exchange rate (see below for more details)[65]. Moreover, there exists evidence that these loans were not repaid on time and the government often extended the guarantee[66].

Loans issued by SF banks were sometimes repaid by the Ministry of Finance borrowing from the same SF banks against promissory notes[67]. New credit repayment schemes were introduced in 2002. They involved borrowing money from SF banks through the issuing of GKOs rather than through NBB monetary emission to obtain resources to repay loans issued earlier by SF banks to state enterprises[68]. When SF banks became too burdened with bad debts they requested the authorities to transfer the enterprises' debt to the Ministry of Finance[69].

In summary, the policy of directed credits and preferential loans had its negative spillover effects on the economy as a whole. All possible consequences of this and other repressionist policies will be considered towards the end of this chapter, after we have a

[63] See, for example, Resolution of the Council of Ministers No.1488 (28 September 1999) and Resolution of the Council of Ministers No.1410 (11 September 2000) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).
[64] As at 2001 the level of capitalisation accounted only for 4.7 per cent of GDP.
[65] See for example Resolutions of the Council of Ministers No.1632 (22 October 1999) and No. 1447 (17 September 1999) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).
[66] See for example Resolution of the Council of Ministers No.667 (12 May 2000) which extends the government guarantee issued on 19 March 1999 on the loan at the amount of USD 6221804 to 'Beltorginvest' till 19 March 2001. See also Resolution of the Council of Ministers No.845 (6 June 2001) and No. 157 (6 February 2002) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).
[67] See for example Resolution of the Council of Ministers No.1682 (19 December 1997) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).
[68] See for example Resolution of the Council of Ministers No.1205 (14 August 2001), Resolution of the Council of Ministers No.1508 (16 October 2001) and Resolution No.30 (10 January 2002) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).
[69] It was, for example, the case of Belarusbank and Agroprombank (see Resolution of the Council of Ministers 'On transferring the debt of some industrial enterprises on loans of IMF to the Ministry of Finance' No.1891 (29 December 2001).

comprehensive picture of all the policies that are integral constituents of the Belarusian financial strategy.

Interest rates controls

No doubt exists that the Belarusian credit policy has primarily been based on the policy of administratively controlled interest rates, in which the official refinancing rate was always used as a yardstick[70]. At the same time it should be acknowledged that availability of the official records of interest rates controls (particularly with regard to lending and deposit rates) is very limited[71]. The Belarusian legal database holding the majority of records on regulation of banks' activity in Belarus contains some fragmentary information on the use of deposit rate floors, margin controls, and lending rate ceilings (primarily for directed credits). Lending interest rates ceilings on loans of commercial banks are only directly mentioned in 'Main Monetary and Credit Guidelines of the Republic of Belarus for 1994'[72] and in the Banking Code[73]. The first document says that 'until the market mechanism of economic regulation is in place, the NBB has the right to carry out a policy of temporarily imposition of lending rates ceilings both on directed credits loans and on loans of commercial banks to real sector'. The second document reads as follows: 'In exceptional cases the NBB has the right to set minimum/maximum lending interest rates for commercial banks in their operations with individuals and legal entities' (paragraph 52). From my personal experience of working in one of the Belarusian SF banks during 1997-2000, it is possible to say that many instructions, including those regulating interest rates, came in the form of the written letters for the 'internal use' of the NBB or in the form of NBB oral 'recommendations'. The fact that most of the information on interest rates ceilings, particularly on lending interest rates ceilings, is confidential, was confirmed by the Head of Foreign Exchange Analysis and Forecasting Division of the NB during our meeting in March 2003.

In fact, the official refinancing rate can give us some indication of the extent of lending interest rates control. As it was mentioned earlier, most of the SF banks' loans

[70] See for example TACIS 2000 (January-March) and Rusakevich 2002.
[71] See appendix C on chronology of interest rates controls and changes in the official refinancing rate.
[72] Approved by the National Bank of Belarus, Letter No.20-94 (2 June 1994) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).
[73] Adopted by the House of Representatives, Banking Code No.441-3 (25 October 2000) (Konsul'tant Plyus: Belarus [CD-Rom] 2002).

were preferential, with the interest rate being either half of the refinancing rate or at the level of the refinancing rate. In turn, the latter was mostly negative in real terms over the whole period (figure 5.5). Here it is worth recalling that these banks were in control of 90 per cent of the lending to enterprises.

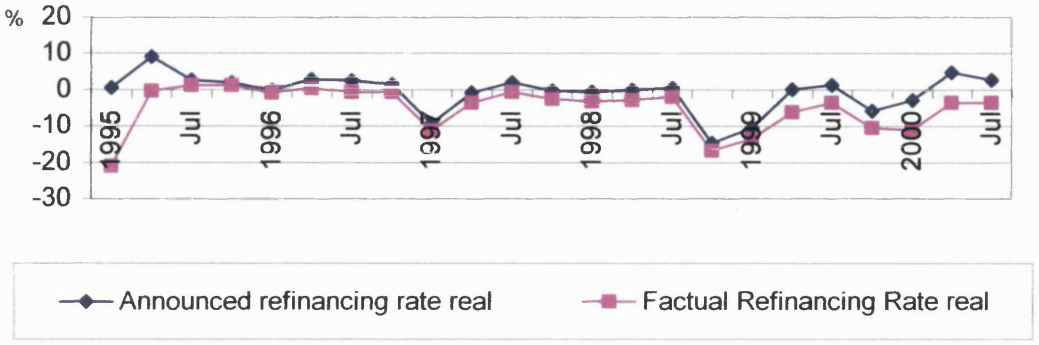

Figure 5.5: Announced and factual refinancing rates[74]

Moreover, following the Roubini and Sala-i-Martin's approach (1992)[75] in the absence of reliable information on the actual controls, the level of real interest rates can be useful in evaluating the degree of the interest rate repression (figure 5.6).

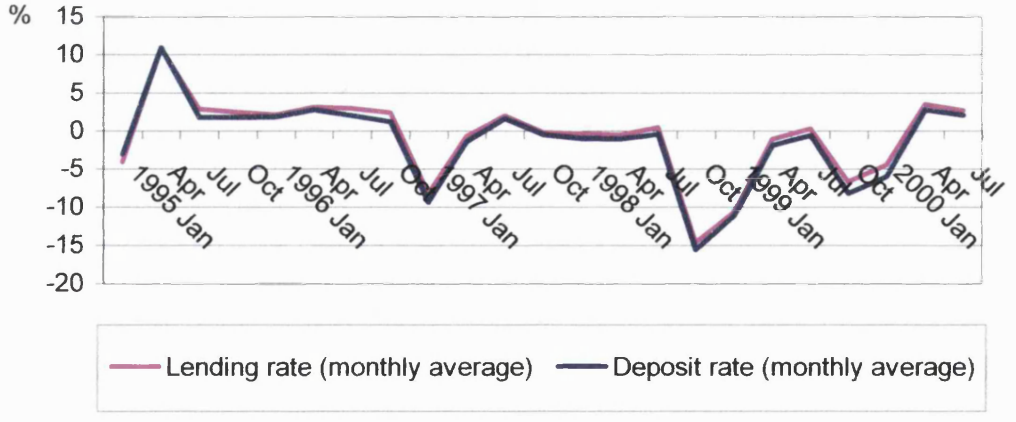

Figure 5.6: Real lending and deposit interest rates[76]

[74] Rusakevich 2002.
[75] See chapter 6 for details.
[76] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003).

As one can see from figure 5.6 that was a significant surge up to 10-11 per cent in both lending and deposit real interest rates in the first half of 1995. Afterwards, they started to decline and were either negative or very low positive until 2000.

As far as deposit interest rate controls are concerned, deposit floors were in place from December 1994 to May 1998. In fact, in 1994-1995 deposit floors played a positive role in alleviating banks' attempts in exploiting market power, which occurred with liberalisation of interest rates at the end of 1994-1995 (see chapter 4). The latter (freeing of interest rates) triggered some banks, particularly in regional centres, to behave as monopolists. The evidence reported by the NBB suggested that banks, in chasing high profits, had tended to decrease as much as possible the deposit rate and in turn increase the lending rate (chapter 4). Thus, by setting deposit floors the authorities made an attempt to end this practice.

There is no documentary evidence of deposit interest rate ceilings. However, as in the case of lending interest rate ceilings, figure 5.6 speaks for itself. Moreover, as Fry argued, 'in the absence of deposit rate ceilings, the FR tax may be still be borne by depositors to the extent that banks are required to use their own resources to acquire non-reserve assets that yield net returns below the world market interest rate' (Fry 1995, p.6). Thus, by being obliged to issue loans at interest rates being low or negative in real terms or to invest in government bonds with the real yield being proxied by the real announced refinancing rate, commercial banks did not have much option in offering comparable returns on deposits. In fact, with the high inflation rate, there was need for deposit rate ceilings as such. Acceleration of inflation was lowering the nominal interest rate in a natural way, if the latter were not adjusted for inflation.

In conclusion, it becomes evident that interest rates never operated as an instrument of efficient allocation of funds in Belarus. Moreover, they, as very high interest rates, had an adverse selection effect on borrowers from the point of view of encouraging investment with lower returns (agriculture, house construction and state enterprises of industrial sector) and crowding out high-yielding investment potentially associated with the private sector.

Reserve requirements

The policy of unprecedented monetary-credit expansion created excess liquidity in the market. The paradox, in fact, was that some of the SF banks (particularly Belarusbank and Agroprombank) were contracting liquidity, while others had it in excess. Thus, the

NBB resorted to the policy of higher reserve requirements to be able to regulate any 'market' imbalances.

DeMelo and Denizer (1997) in their work on monetary policy during transition use 12 per cent or less as a yardstick for maximum reserve requirements for transition economies to be recognised as market-oriented.

It would be fair to note that in Belarus this instrument was not exercised so heavily in a sense that reserve requirements have never exceeded 30 per cent and their trend have been changing from upwards to downwards. However, reserve requirements were still in excess of 12 per cent during the most of the analysed period. After some easing up in 1995, the authorities have raised them again from the third quarter of 1996. In the fourth quarter of 1997-1998 reserve requirements reached their maximum of 21 per cent and started to decline, heralding again at the beginning of 2000, as one can see from figure 5.7.

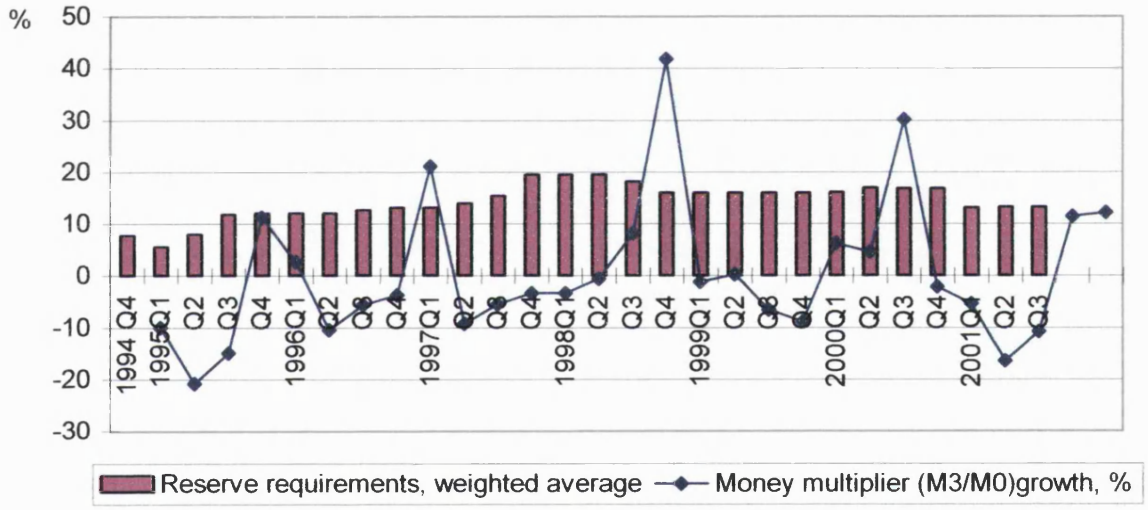

Figure 5.7: Reserve requirements and money multiplier (M3/M0) growth[77]

The above figure shows the expected relationship between money multiplier growth and reserve requirements, implying the surge in the former leads to a fall in the latter. However, it does not always hold in our case. For example, the rise in reserve requirements in 1996 was accompanying by the rise in the money multiplier. It can be

[77] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003). Reserve requirements calculated as a weighted average of reserve requirements on demand, time rouble deposits and deposits denominated in foreign currency. M3 aggregate denotes broad money, inclusive deposits denominated in foreign currency.

explained by the fact that SF banks, being unable to cope with rising requirements, were sometimes given concessions by the NBB.

Despite being not so heavy in relative terms, the policy of high reserve requirements can still have a greater negative effect on financial sector than would be expected. Under high inflation higher reserve requirements have a magnified effect, increasing the wedge between deposit and lending rates (see Fry (1995, p.43) for an illustrative example). Thus, under de-facto controlled lending rates deposit rates could have been potentially negligibly low. That is why the authorities had to impose deposit floors in 1996-1999.

Finally, a rise in reserve requirements can also be viewed as a way to increase government revenue from seigniorage as reserves constitute monetary base, increase in which in real terms is positively related to gains from seigniorage. This issue is dealt with in details in chapter 7.

Multiple exchange rates policy

The policy of foreign exchange can be divided into three main periods: 1993-4, when floating exchange existed, 1995-6 with fixed exchange and 1996-2000, with its 'planned devaluation' system[78]. The latter was particularly noticeable as it rested upon the policy of multiple exchange rates. There had been six exchange rates in Belarus in 1996-2000: the official rate set by the NBB to be used for tax and accounting purposes; for surrender of obliged 30-40 per cent of exporters' earnings (corresponds to stock market exchange rate (main session); the stock market exchange rate (additional session) for surrender additional obliged 10 per cent of exporters' earnings; the non-stock market exchange rate or commercial rate for inter-bank settlements; the non-resident market exchange rate (quotations of the Central Bank of Russia, the exchange rate 'set' by commercial Belarusian banks for cash currency sale to individuals; the black market rate. In fact, since the official exchange rate was on average 60 per cent lower than the market exchange rate (see figure 5.8), by surrendering their 30-40 per cent of earnings at the official exchange rate exporters were paying an additional 15 per cent tax[79].

[78] The mechanism of rate's formation on a market basis actually began to work since 4 January 1993, when the NBB introduced the quotation of the Belarusian rouble to hard currencies.

[79] 15 per cent = .40*.60/1.60 (Nuti 1999, p.8).

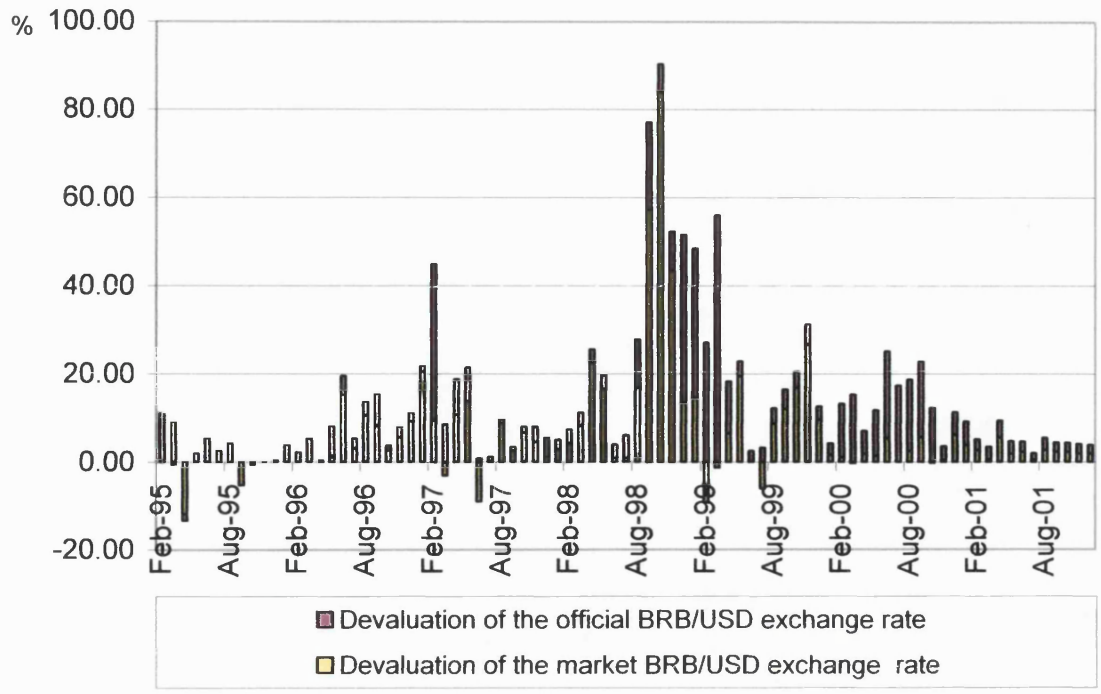

Figure 5.8: Devaluation of the official and market BRB/USD exchange rate

In 1999 the authorities initiated transition to the uniform and stable exchange rate and convertibility of the Belarusian rouble in the area of current account's operations. Indeed, at the end of 1999 the NBB liberated the exchange rate set by commercial banks for cash currency sale to individuals (appendix B). By September 2000 the official exchange rate was devalued to the market level, which, in turn, was held in by partial 'sterilisation' of money supply and achieved positive rates. After the unification, the exchange rate has remained relatively stable.

The policy of multiple exchange rates revealed its ineffectiveness that is to be examined under 'Policies implications'.

Policy implications

All the four discussed policies, comprising the Belarusian financial policy in the late 1990s, had a magnified negative effect on the economic development.

Thus, the expansionary policy of directed credits and preferential loans, targeting, in the first place, 'strategic' (state) enterprises, resulted in high inflation and devaluation of the Belarusian rouble.

One of the important implications of inflationary financing is decline in real cash balances, as prices rise in greater proportion than the quantity of money. This results in finance shallowness that has a negative impact on economic growth.

That is exactly what happened in Belarus in the late 1990s. Together with the policy of negative real interest rates, it boosted the aggregate demand resulting in economic growth in 1997. However, the economic growth is rather a short-run phenomenon. The inability to stimulate domestic saving and therefore private fixed investment imposes constraints on its sustainability. Indeed, both inflation as a result of monetary-credit expansion and the policy of low deposit interest rates discouraged domestic savings that in the context of restrictions on capital inflows should have remained the main source of financing of economic agents (discussed in chapter 8). Figure 5.9 shows the change in financial depth, defined in a narrow sense as a ratio of total bank deposits denominated in roubles to GDP.

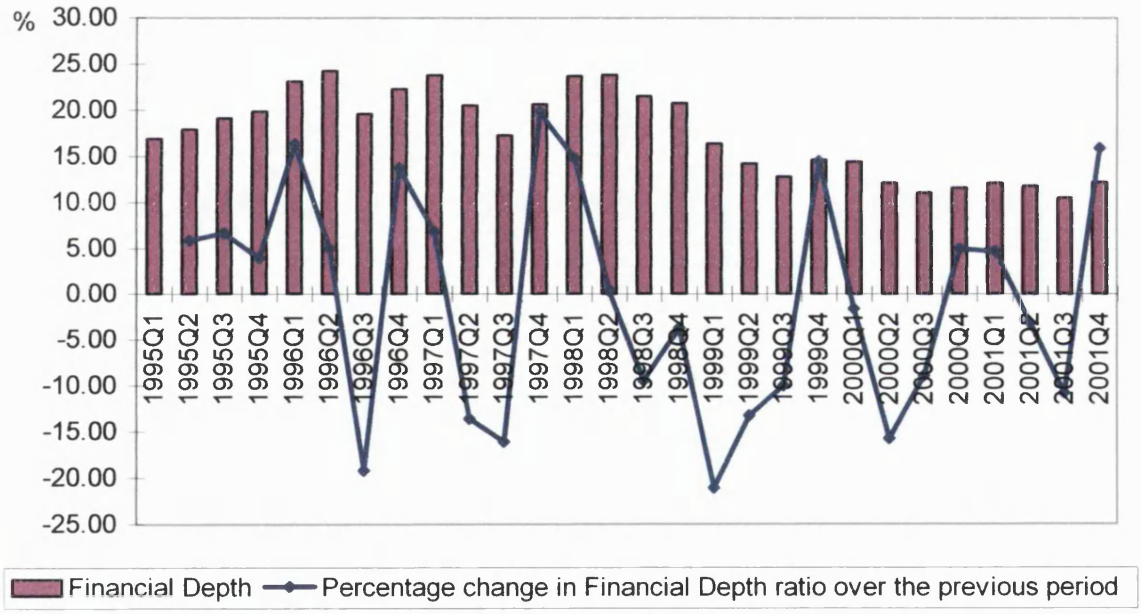

Figure 5.9: Financial depth, measured as a ratio of quarterly average rouble bank deposits to GDP nominal[80]

As one can see the ratio of total rouble deposits to GDP never exceeded 25 per cent, implying that, as a potential source of investment, domestic deposits played a fairly insignificant role in financing the Belarusian economy. In fact, as only 70 per cent of the economy was monetised, it does not seem so surprising. Financial depth ratio

[80] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003).

decreased from 69 per cent of GDP in 1990 to 10 per cent in 2001. However, while acknowledging the problem of finance shallowness the authorities find its solution in increasing demand for money elaborating a package of measures[81] that were believed to increase the coefficient of monetisation. What is interesting is that the figures of monetary growth and inflation were stated as the directions in the government programme of money demand increase, without supplying any calculations of these rates or at least explaining their rational origin.

Another consequence of the policy of directed and preferential credits was devaluation of the Belarusian rouble. With increasing inflation and the Belarusian Rouble losing its credibility, dollarisation of the economy became obvious.[82]

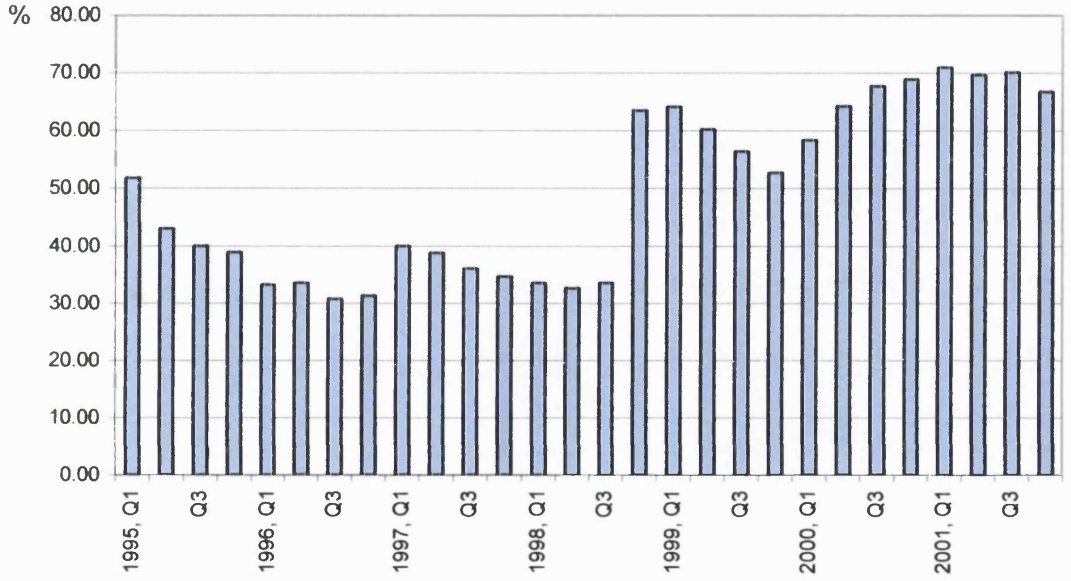

Figure 5.10: Foreign currency deposits as percent of total deposits[83]

The analysis of the problem of substitution of national currency in Belarus focuses more on foreign currency deposits (FCD) measure because of the unavailability of reliable data on the amount of Dollar currency in circulation within the domestic economy and cross-boarder deposits held at banks abroad, that also can serve as measures of dollarisation.

[81] Resolution of the Council of Ministers of Belarus and the National Bank of Belarus 'About the programme of the measures to increase demand for money in 2002', No.1875/30 (28 December 2001).
[82] The term 'dollarisation' serves as shorthand for the use of any foreign currency.
[83] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003).

Figure 5.10 indicates that Belarus is typified by FCD constituting a significant percentage of total deposits, of between 30-70 per cent. The observed tendency of FCD decreasing in 1995-1996 was mainly due to the tightening of monetary policy in 1995 and as a result a significant fall in inflation followed and the policy of positive real interest rates. The surge in FCD at the end of 1998 in Belarus can be explained by the sharp devaluation of the Belarusian Rouble, caused by the Russian financial crisis. From 1999 to 2001 the share of FCD in total deposits remained high, which is in line with a policy of money emission feeding inflationary tendencies (see figure 5.10).

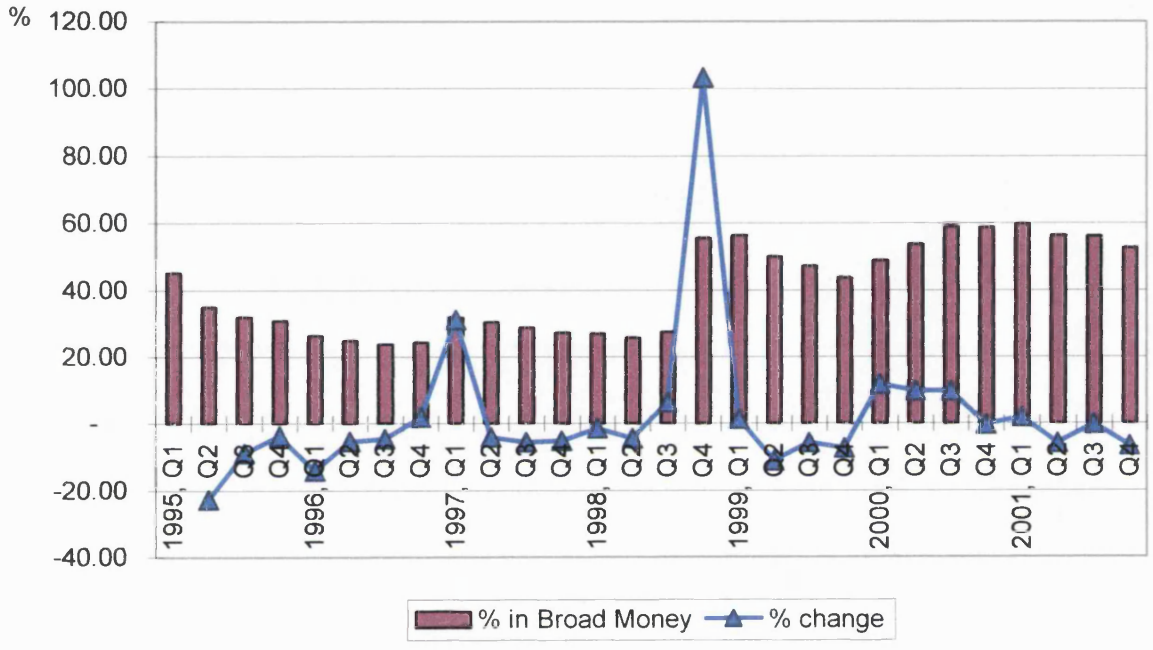

Figure 5.11: Foreign currency deposits (as a percent of M2), 1995-2001[84]

One should note that with the ratio of FCD to broad money exceeding 30 per cent, Belarus can be classified as a highly dollarised economy. Moreover, high inflation in terms of the continuously exercising policy of money emission, remained the main obstacle for reducing the degree of its dollarisation in Belarus.

So, the policy of multiple exchange rates appeared to be an instrument to hold down the price of foreign exchange. In turn, it created the deficit of foreign currency in the official market that stimulated the development of the shadow market. The

[84] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003).

overvalued Belarusian rouble encouraged importing that spilled into the current account deficit.

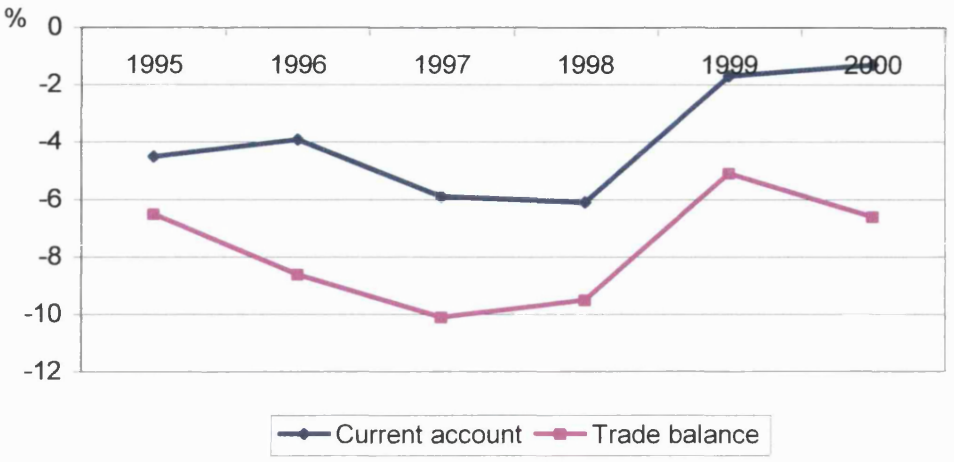

Figure 5.12: Trade balance and current account, as a % of GDP[85]

Moreover, excess demand for foreign currency triggered the authorities to impose foreign exchange and cross-border payments restrictions. The latter as well as high inflation, wiping out enterprises' nominal assets, induced them to turn to the use of alternative financial mechanisms and barter operations. According to the official data, non-monetary operations had a steadily constant share of 30 per cent in total annual sales during 1997-2002. Along with barter operations accounting for majority of non-monetary operations, enterprises have been using promissory notes and commercial credit as substitutes of bank money. According to some experts, extensive reliability of the Belarusian enterprises on barter transactions appears as one of the most important factors that contributed to the resumption of the economic growth in the late 1990s (see TACIS 1999).

Finally, financial strategy encompassing all aforementioned policies, although seemed to have contributed to revitalising the Belarusian economy, but mainly, perhaps, in a short run, if at all. In a long run, it resulted in financial disintermediation and forced enterprises to search for alternative ways to stay afloat.

Overall, the examination of financial development in Belarus in the 1990s, with a particular focus on 1996-2000, revealed the following.

[85] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003).

First of all, the policy of financial repression in Belarus had primarily political grounds in a sense that under the worsening of macroeconomic situation and decline in living standards of population it aimed at providing sustainability of the Belarusian 'populist' model of economic development that, in turn, was a key to the viability of the Belarusian political leadership.

Second, financial policy introduced in Belarus in the second half of the 1990s, and comprising the polices of directed and preferential credits, negative interest rates, high reserve requirements and multiple exchange rates, can be characterised as financial repression. Moreover, repressionist financial policy had its complements in development strategy in a form of price controls and wage increases policies, restrictions on import-export operations and fiscal policy envisaging various tax concessions for some agricultural and industrial 'strategic' enterprises.

Third, financial repression had rather short-term positive effects on economic development through money-led stimulation of investment and consumption, particularly surging in 1997-98. However, in the long run the policy appeared to be disrupting the economy as it led to demonetisation, dollarisation and financial disintermediation that in theory were believed to hinder economic growth. The next two chapters test these assumptions.

Chapter 6 Financial Restraints: Explaining the Phenomenon of Financial Disintermediation in Belarus at the end of 90s

In chapter 5 we discussed the special features of developments in the financial sector in Belarus over the period from 1995-2002 and hypothesised that financial restraints imposed on the Belarusian financial sector by the government can be termed financial repression. The present chapter aims to provide some empirical evidence on the case study of financial repression in Belarus. In particular, using various econometric techniques, we are going to test if there was financial repression in Belarus in 1996-2000 and, if so, we will estimate its impact on financial deepening with further inferences drawn for the Belarusian economic growth pattern of the late 1990s.

6.1 Evolution of Financial Repression Models

While chapter 3 unveils the main empirical findings regarding the impact of financial repression on financial development and economic growth, the present section focuses on some elaborate theoretical financial repression models and on how these models have evolved over the time.

As discussed earlier, most of the empirical studies of financial repression, particularly first generation financial repression models, placed an emphasis on the key instrument of financial repression, namely the deposit interest rate ceiling. In such models (see, for example, Kapur 1976 and Mathieson 1979) an increase in the deposit rate of interest was claimed to be a primary instrument of stabilisation policy. In fact, these studies departed from the McKinnon-Shaw proposition that 'inflationary economies – at least the less-developed ones – tend also to be financially repressed' (Kapur 1976, p.777). Therefore, 'this phenomenon of financial repression should be integrally incorporated into any analysis of stabilisation policy: in particular, it is claimed that, as a result, stabilisation through an initial increase in the average nominal interest rate paid on money holdings is likely to have significantly more favourable short-run effects on the time path of real output than is stabilisation through an initial reduction in the rate of monetary expansion' (ibid).

Assuming 'technical complementarity between each hour of use of fixed capital and the associated requirement of working capital', Kapur (1976) argued that fixed capital was not utilised at its full capacity because in financially repressed economies

financing of working capital was restrained. It was assumed that bank credit was used to finance only the fraction of the cost of replacing 'worn-out' working capital and net investment in working capital. Under conditions of a fixed nominal deposit interest rate leading to a shortage of savings, demand for bank loans was always in excess of their supply.

Based on the Harrod-Domar model of growth[1], Kapur's macroeconomic model took the following form[2]:

$$\gamma = \mu \frac{M}{PY} * \frac{\sigma * q}{(1-\alpha)} - \pi\theta, \tag{6.1}$$

where γ denotes the rate of economic growth, μ stands for monetary growth, M is nominal money holdings, P is current price level, Y is real GDP, σ is the output-capital ratio, q is the ratio of bank credit to money, α is the ratio of utilised fixed capital to total utilised capital, π is the inflation rate, and θ is the fraction of the cost of replacing depleted working capital financed by bank loans.

As in most of the early empirical studies, Kapur's model was based on the assumption that the output-capital ratio σ was constant. Therefore, this allowed financial conditions to affect only the quantity of investment, whereas later studies revealed that growth was mainly attributed to improvements in the quality of investment or in other words to the increase in the productivity of capital expressed as the output to capital ratio (see chapter 3).

In (6.1) the rate of economic growth is positively associated with the rate of monetary growth, the output-capital ratio, the ratio of bank credit to money and the ratio of utilised fixed capital.

Kapur's money demand function, nested into equation (6.1)[3], is based on Cagan's money demand function:

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[1] It should be noted that the analysis of the effect of finance on economic growth can depend on the choice of the model of economic growth (Fry 1995, p.12). Thus, the Harrod-Domar model, based on constant marginal returns to capital, supports an argument of financial policy having a permanent effect on economic growth through the savings-investment ratio. At the same time, the neo-classical economic growth model, by assuming diminishing marginal returns to factors of production, envisages only short-term effects on economic growth through the savings-investment ratio and no effect on economic growth in a long run. Finally, endogenous growth models, assuming constant or increasing marginal productivity of capital due the presence of positive production externalities (for example from the learning process of capital), also suggest a permanent effect of the investment ratio on economic growth.

[2] For stepwise derivation of the model see Kapur (1976).

[3] For this $\frac{M}{PY}$ in (6.1) is substituted with $e^{-\alpha(\pi^e - d)}$ from (6.2).

$$\frac{M}{P} = Ye - \alpha(\pi^e - d), \tag{6.2}$$

where M/P denotes real money balances, Y is real GDP, d is the average nominal deposit interest rate, π^e is the expected rate of inflation, α is a positive constant denoting the semielasticity of the demand for money with respect to the rate of inflation.

Kapur's work suggests that an increase in the deposit rate has a more rapid deflationary effect than a reduction in the monetary growth rate. He attributes this to the fact that 'an increase in the deposit rate directly increases the expected real return to money perceived by money holders, whereas a reduction in monetary growth rate can only increase the expected real return after it has worked through the entire system to produce a fall in the expected inflation rate'[4] (Kapur 1976, p.790). Thus, one of the policy implications of these models is abolishing interest rate ceilings.

Developed in the 1980s and early 1990s, endogenous growth models (see for example Lucas 1988, Greenwood and Jovanovic 1990, Bencivega and Smith 1991, 1992 and King and Levine 1993) in the first place aimed at establishing the rationale for financial intermediation and at providing an explanation of how financial intermediaries emerged (see Fry 1995, p.76). In this strand of literature, growth is modelled endogenously – 'that is, it does not depend on exogenous technological change' (Greenwood and Jovanovic 1990). It was believed that in the early stages of economic development financial institutions are virtually absent, as financial intermediation requires some fixed entry costs (transaction costs) to be paid by individuals who wish to use financial intermediaries' services (see Fry 1995). Individuals begin to resort to the financial sector's services, as they reach the point at which their wealth exceeds some minimum level and they start thinking of optimising their wealth. At this point, financial intermediaries emerge onto the stage, as they can offer individuals a bigger variety of financial products with varying returns and a possibility to minimise investors' risks through diversifying their portfolios.

The rationale for the existence of financial intermediaries in endogenous growth models is dictated by the presence of uncertainty and is related to its risks and costly information, implying high monitoring costs (see Pagano 1993 and Fry 1995). Financial institutes can encourage allocation of individuals' savings towards the most productive

[4] This explanation was initially offered by McKinnon (see Kapur 1976, p.790).

investment. It can be done through collecting and analysing information by financial intermediaries and then channelling funds to their most profitable use, in this way raising the average return to capital (see Greenwood and Jovanovic 1990); by 'providing maturity intermediation' by increasing liquidity of investment and therefore decreasing the premature withdrawals of investors (see Bencivenga and Smith 1991); by optimising transaction costs by allowing, first of all, financial institutes to perform a monitoring task that reduces the costs of each individual doing this (see Blackburn and Hung 1998); and sharing the risks[5] (see Saint-Paul 1992). The existence of a bi-directional relationship between financial development and economic growth is advanced in endogenous growth models; that is, development of financial institutes is stimulated by rising incomes, while simultaneously financial intermediaries affect growth via raising the productivity of investment and the saving ratio[6] (Fry 1995, p.75). Thus, unlike first-generation models, endogenous growth models contend that financial intermediation affects growth not only through an increase in savings rate but also through improvement in the quality of investment.

The basic endogenous growth model is the 'AK model', in which aggregate output is a function of aggregate capital stock. Based on Pagano's presentation, the Lucas (1988) endogenous growth model takes the following form (see Pagano 1993, p. 614):

$$g = A\phi s - \delta, \tag{6.3}$$

where g is the economic growth rate, A is the marginal productivity of capital, ϕ is the proportion of savings channelled to investment and δ is the capital depreciation rate.

The model suggests (as was adumbrated earlier) that there are three ways by which the development of a financial sector can affect economic growth, namely through 1) an increase in the productivity of investments; 2) reduction in transaction costs that will result in an increase in the share of savings channelled towards investment (see chapter 3); 3) an increase in the savings rate.

[5] In his model Saint-Paul (1992) argued that productivity could be increased through obtaining a greater degree of specialisation of firms. In turn, it was recognised that the latter may well have increased risks from sectoral demand shocks. However, these risks can be minimised by letting investors to diversify their portfolios via the stock market (this is possible upon condition that a well-developed stock market exists) (Saint-Paul 1992).

[6] In endogenous growth theory each firm faces constant or even declining returns to scale, but due to the existing positive production externalities from knowledge component of capital overall productivity turns to be an increasing function of the aggregate capital stock (see Fry 1995 and Pagano 1993).

In the context of the finance-growth nexus, endogenous growth theory has several implications for financially repressed economies. By the definition of financial repression, financial intermediaries in such economies cannot perform the role assigned to them by endogenous growth theory (as noted above) to ensure the allocation of capital to its most productive use. In the first place, due to some legislative restrictions imposed on the financial sector, no effective formal institutions exist in such economies that could guarantee high and risk-minimised returns to investors. In an environment of uncertainty, investors tend to be highly risk-averse and prefer to invest in unproductive tangible assets. Moreover, directed credit and preferential loans schemes, widely exercised in FR economies, lead to ineffective allocation of scarce funds, mainly channelled towards low productive and non-profitable projects, leaving few prospects for economic growth sustainable in the long-run.

The present study of the impact of financial repression on financial deepening and economic growth in Belarus is based on various works of Demetriades and Luintel that were introduced in chapter 3. In particular, the model of financial repression is adopted here with some adjustments made for specific features of economic development in Belarus during the period of examination.

6.2 Specifying the Functional Model to Estimate an Impact of FR on Financial Development and Economic Growth in Belarus

As it was shown in chapter 5, the banking system in Belarus, being a pillar of the financial system, was highly monopolised in 1996-2000. It was (and has remained to a large extent) a state monopoly, with authorities intervening in economic activity and repressing the financial sector. As our analysis in chapter 5 revealed, the Belarusian case of financial repression, particularly of interest rates, was rather severe (with interest rates set far below the competitive free-market equilibrium interest rate). Therefore, it is believed to have discouraged savings and consequently reduced the volume of loanable funds, and lowered the productivity of investment. This should have had an adverse effect on the rate of economic growth in the long run, if financial structure did matter for economic growth.

In order to examine the impact of FR on financial depth we will estimate equation (6.4) replicating the model that Demetraides and Luintel (1997) use to examine the Indian case of financial repression:

$$LFD_t = \alpha_o + \alpha_1 LY_t + \alpha_2 R_t + \alpha_3 FRI_t + \alpha_4 DEV_t + u_t, \quad (6.4)$$

where LFD is the log of financial depth, measured as the ratio of bank deposits to nominal GDP;

LY is the log of the real GDP per capita;

R is the real deposit interest rate;

DEV is the rate of devaluation of domestic currency;

FRI is a summary measure of financial repression.

The above model is adjusted for the following special feature of economic development in Belarus over the period of interest. As was mentioned in chapter 5, one of the consequences of repressionist policies in Belarus in 1996-2000 was dollarisation of the Belarusian economy. Therefore, we introduce the DEV variable to proxy dollarisation. To construct this series it is necessary to recall the multiple exchange rate regime operating in Belarus from 1996 to 2000. Since there is no reliable information on the volume of currency transactions carried out for each separate exchange rate, we follow the National Bank of Belarus's method to overcome this problem. Thus the nominal exchange rate is to be computed as a weighted average of official (15 per cent) and market end-of-month exchange rates (85 per cent)[7]. With financial depth measured as total rouble deposits to nominal GDP, the coefficient of DEV is expected to have a negative sign[8].

As noted in chapter 5, the widespread use of barter and other non-monetary operations in transactions between economic agents was another consequence of repressionist policies in Belarus between 1996-2000. But, it is impossible to address this problem due to the lack of information on barter transactions.

Our empirical analysis has two objectives. First of all, it aims to examine whether financial policy introduced in Belarus in 1996-2000 can be dubbed as financial repression, and if so, what the effects were of repressionist policies on financial deepening. Second, it aims at unveiling the interactions between financial depth and economic growth.

[7] These proportions are based on the NBB approximate evaluation of the volume of transactions that are carried at each exchange rate.

[8] It would be also interesting to estimate an equation with financial depth measured as a ratio of deposits nominated in foreign currency to GDP from the point of view that the real deposit interest rate (on deposits nominated in FXC) and devaluation of domestic currency should have positive effects on financial depth. However, due to the lack of data on the deposit interest rate on FXC deposits this analysis cannot be undertaken.

In the first instance, we hypothesise that financial repression took place in Belarus in 1996-2000. Therefore we expect the coefficient of FRI in equation (6.4) to be statistically significant. Moreover, if FRI variable turns out to be statistically different from zero, it will confirm the findings of Demetriades and Luintel (1997, 2001) that repressionist policies exert a direct impact on financial deepening that is independent of influence of FR through the real deposit rate of interest. We also put forward a hypothesis that the repressionist policies, on the whole, had a negative influence on financial depth and economic growth over the period. With regard to the former, the coefficient of FRI is assumed to enter equation (6.4) with a negative sign. In the second instance, we consequently expect that financial development inhibited economic growth in a long run, if finance mattered for economic development.

6.3 Methodology and Data

The monthly data run from May 1995 to December 2002. The sample is chosen on the basis of data availability (see chapter 1 for more detail) and the desire to incorporate both the 1996-2000 repression and the fragments of partial financial liberalisation which occurred in 1995 and in 2001-02. There are 92 observations in total.

Financial depth is measured by total bank deposits nominated in roubles to nominal GDP denominated in roubles. Data on rouble bank deposits, 6-month nominal deposits and lending interest rates (the latter is needed to construct the index of FR), official and market-determined parallel exchange rates were obtained from the National Bank of Belarus. Real deposit/lending rates are defined as the nominal deposit/lending interest rate minus the current rate of inflation[9]. The rate of inflation is defined as the percentage change in a consumer price index (CPI). Data on the monthly rate of inflation and monthly real GDP (see appendix F for checking reliability of GDP data) were provided by the Belarusian Research Centre of Institute of Privatisation and Management (IPM), which in turn obtained the data from the Ministry of Statistics and Analysis (MSA). The real GDP per capita series is calculated by dividing the aggregate series by population. The financial depth and real GDP per capita are in logarithmic form.

[9] We use the current rate of inflation to calculate the real deposit rate, assuming the prevalence of rational expectations in the formation of the inflation rate (see chapter 7 for justification of the assumption). Therefore, for simplicity we assume that the expected rate of inflation formed rationally is equal to the actual rate of inflation.

Figures 6.1, 6.2, 6.3, and 6.4 present all the aforementioned variables graphically.

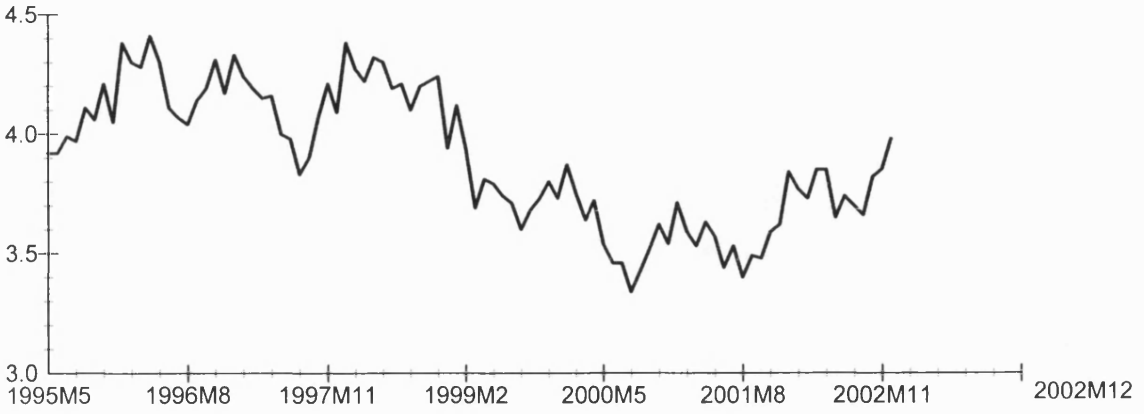

Figure 6.1: Natural logarithm of financial depth[10]

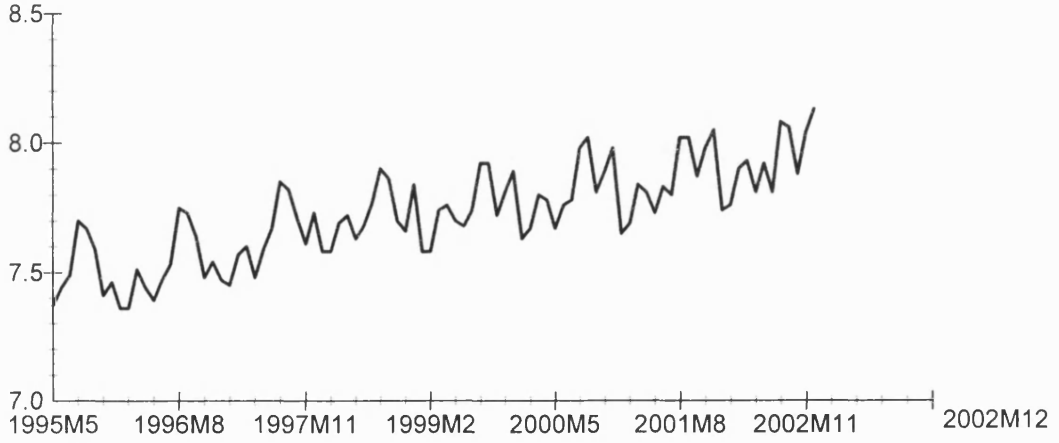

Figure 6.2: Natural logarithm of real GDP per capita[11]

[10] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003).

[11] Authors' calculations on the data provided by the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003].

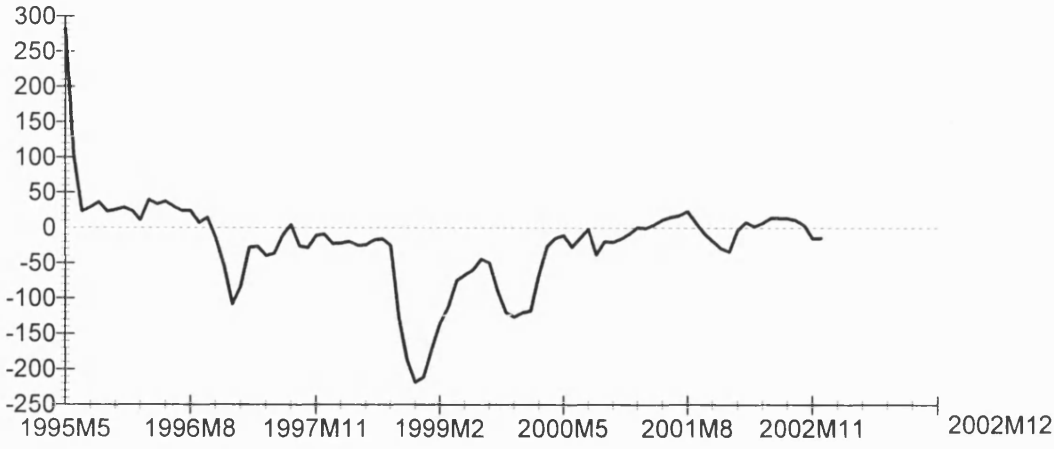

Figure 6.3: Real deposit interest rate[12]

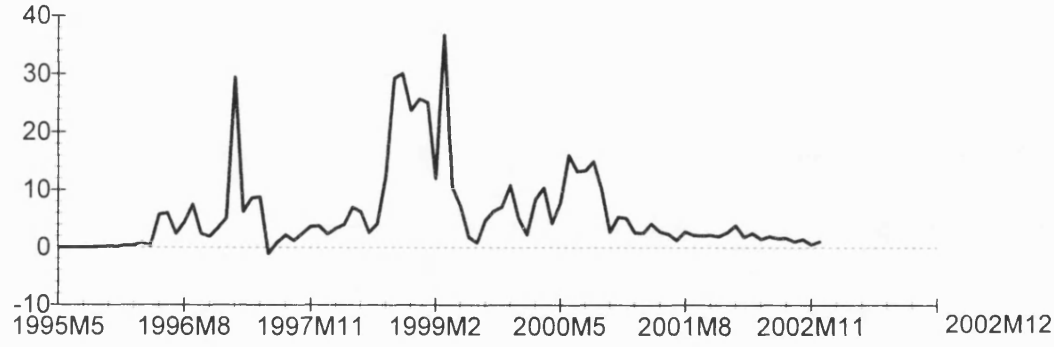

Figure 6.4: The rate of devaluation of the Belarusian Rouble versus US Dollar[13]

From these graphs, the first trend which is notable is that the log of real GDP (LNY) exhibits a seasonal pattern.

By testing all four series for seasonality, the results of the variable deletion test show that the introduced seasonal dummy variables are jointly significant only in the log of the real GDP series[14]. The real GDP series was seasonally adjusted using an X-

[12] Authors' calculations on the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NBB during our meeting in March 2003.
[13] Ibid.
[14] F statistic (F (11, 80) is equal to 3.69 with probability 0.000 that rejects the null hypothesis of joint insignificance of seasonal dummies at the 1 % level of significance.

11.2 procedure[15] performed in EViews Version 3.1. All other estimations are conducted using either Microfit version 4.0 or EViews Version 3.1.

To avoid multicollinearity and a reduction in the degrees of freedom we use a summary index of FR instead of introducing each repressionist policy individually (see Demetriades and Luintel 1996, 1997, Roubini and Sala-i-Martin 1992). We compose two alternative summary measures of financial policies to take into account the joint influence of all of the policy variables (Demetriades and Luintel 1996, 1997). The first one, FRI_1, is a simple arithmetic mean of all policy variables. The second one, FRI_2, is constructed on the basis of principal component analysis[16]. Normalising policy variables (subtracting the mean and dividing by the standard deviation) preceded the construction of both indices.

The index is comprised of series on the following repressionist policies.

i. Deposit rates ceiling;
ii. Lending rates ceiling;
iii. Directed credit schemes and loans with concessionary lending rates to priority sectors;
iv. Reserve requirements

Because of the fragmentary nature of official data recording ceilings on deposit and lending interest rates, the first two controls are measured on the basis of Agarwala's approach (1983).[17] In the latter, the degree of interest rate repression is defined as high when real interest rates were less than minus 5 per cent per annum; medium when they varied between 0 and minus 5 per cent per annum; and low/absent when real interest rates were positive. Respectively, values 3, 2 and 1 are assigned to a dummy variable denoting FRI in Agarwala's work. In Belarus, the annual real interest rate sometimes exceeded minus 200 in 1995-2002. Thus, in order to capture the severity of interest rates repression, we use a different scale of values for the dummy variable. It takes the value of zero when interest rates are positive; one when they are in a range between 0

[15] X-11.2 procedure is based on the U.S. Bureau of the Census X-11 seasonal adjustment program. It uses a sequence of moving average filters to seasonally adjust data. Decomposition of series may take two forms, namely multiplicative and additive. The former is used when the series can be decomposed into a product of a trend and a seasonal component, while the latter is appropriate if the series can be decomposed into a sum of a trend and a seasonal component. A multiplicative method was used in the present work. For the technical details of the procedure see the Bureau of the Census report (1969).

[16] For a discussion see, for example, Theil (1971).

[17] As Roubini and Sala-i-Martin's (1992) work suggests, the distortion dummy defined as dichotomous, taking the values zero when financial restraints are present or one when they are not, may not capture the severity of financial repression, producing statistically insignificant results.

and minus 20; two when they vary between minus 21 and minus 40 and so forth, up to a value of eleven when real interest rates exceed minus 200. As one can see, the value of a dummy variable is greater as the degree of repression increases.

The 'directed and preferential credits' repressionist instrument reflects the intensity of the program. The dummy variable is zero for no direct credit; and one, two and three when the share of directed and preferential loans reach 20 per cent, 21-40 per cent, and over 40 per cent, respectively, of total bank credit.[18] As only annual data on the directed credit program in Belarus are available, some subjective judgement was used to construct this variable. Monthly data were derived on the basis of annual data, taking into account the seasonal pattern of agricultural subsidies and the even annual distribution of house construction loans.[19] Preferential loans are also taken into account while constructing the dummy variable. Since no data are available on the volume of these loans, information obtained during interviews with the NBB officials and from the official governmental and NBB documents (see chapter 5) served as the basis for judging the scale and intensity of this program.

Finally, the required reserve ratio is computed as a weighted average of the reserve requirements rate on demand and time deposits. The share of demand and time deposits in total deposits nominated in BRB are respectively used as weights. Data on the required reserve ratio was provided by the NBB.

A factor (principal components) analysis performed in SPSS identified two principal components constructing FRI_2. Interest rate ceilings seem to load more to the first principal component, while reserve requirements and directed and preferential loans scheme load to the second one. Cumulatively both components account for 84 per cent of the total variation in the policy variables. FRI_2 is constructed as a weighted average of these two components, where the weights are equal to the relative contribution of each component in explaining the total variation. Thus, if the first principal component explains 54 per cent of variation, then the weights attached to it will be equal to 54/84.

Both the arithmetic average index and the one computed on the basis of principal components analysis were linearly transformed to take the value 0 in May

[18] The approach is adapted from Demetriades and Luintel (1997).
[19] To recall from chapter 5 both sectors were the major recipients of directed credits.

1995 and to be scaled by 100 (see figure 6.5). They are strongly positively correlated with each policy variable.

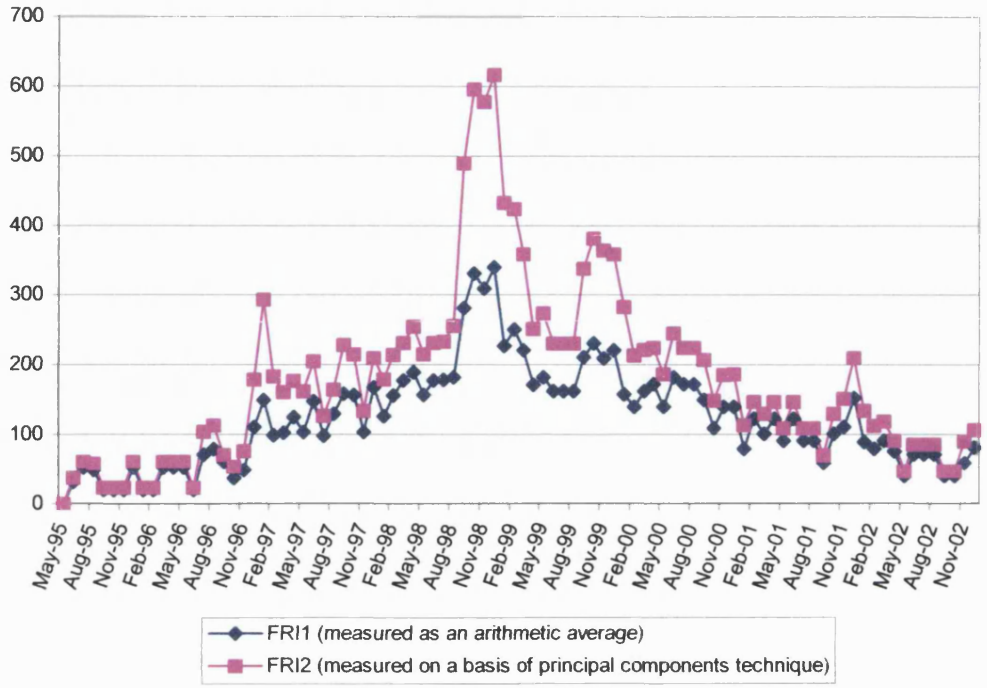

Figure 6.5: Financial repression index, FRI[20]

As one can see from figure 6.5 the trends of both indices are identical, although FRI_1 is lower compared to FRI_2. The difference between them particularly sharpens in September 1998 when financial crisis in Russia hits the Belarusian economy. It can be explained as follows. Recalling the results of factor analysis interest rate ceilings load more than the other two elements to the first component that explains the major proportion of variation in the index. With inflation rocketing in the aftermath of the financial crisis and nominal interest rates undergoing minor adjustment, real interest rates fell significantly, on average from minus 16 to minus 149 per cent. The change in the volume of directed credits and the ratio of reserve requirements was rather minor comparing to the one in the rate of the real interest. All this explains why FRI_1, computed as an arithmetic average, looks smoother on a graph around the timing of financial crisis than FRI_2 that is computed on a basis of principal components analysis.

[20] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NBB during our meeting in March 2003.

The index of financial repression is fairly low during May – November 1996 and 2001-2002, denoting the periods of partial financial liberalisation. It rises from December 1996, reaching its peak in September 1998 – February 1999 in the aftermath of financial crisis in Russia. Thereafter it exhibits a downward trend.

6.4 Empirical results

6.4.1 Unit root tests

To ascertain the order of integration or in other words to test our series for stationarity we begin by applying the Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) tests. The ADF test presents the higher AR version of the DF test. Regressions (6.5) and (6.9) were estimated to test for the presence of a unit root in level and in first differences of series, respectively:

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta y_{t-i+1} + \alpha_1 t + u_t \tag{6.5}$$

$$\Delta^2 y_t = \alpha_0 + \gamma \Delta y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta^2 y_{t-i+1} + \alpha_1 t + u_t \tag{6.6}$$

Along with (6.5) and (6.6) two other regressions were estimated; the first with a linear trend not included in (6.5) and (6.6), and the second with both intercept and a linear trend again, not included in (6.5) and (6.6). The null hypothesis in the ADF is the presence of a unit root in the series[21]. The choice of the appropriate number of lags to be used in the ADF test can be determined by starting from a lag length of 12 and examining the reduction of each lag length, with the Akaike information criterion (AIC) or Schwarz Bayesian Criterion (SBC) as model selection criteria. The model with the highest value of AIC or SBC is a parsimonious one. However, sometimes these criteria can produce conflicting results. In this case the lag-length is determined by showing the residuals are white noise[22]. In other words, if for example elimination of the lags produces serial correlation, then the lags are added back.

Table 6.1 presents the summary of the ADF test for the presence of a unit root in levels.

[21] See appendix E for the detailed description of the Dickey-Fuller and the Augmented Dickey-Fuller tests.

[22] The DF distributions are based on the assumption that an error term is 'white noise' (Harris 1995, p.32).

The results show that for the natural logarithm of real GDP per capita seasonally adjusted, for the real deposit interest rate (R) and for the rate of devaluation (DEV) it is possible to reject the null hypothesis of a unit root at the 1 % and 5 % levels of significance. This implies that these variables are stationary in levels, or in other words they are I(0). Moreover, for LNYsa series the ADF regression contains both deterministic terms, namely an intercept and a linear trend, while for R and DEV the ADF regression is a random walk[23]. The results of the ADF test for financial depth and for the index of financial repression cannot reject the null hypothesis of a unit root, and this implies that these variables are not stationary in levels.

Variable /Test statistic	τ_τ	$\tau_{\alpha\tau}$	$\tau_{\beta\tau}$	ϕ_3	ϕ_2	τ_μ	$\tau_{\alpha\mu}$	ϕ_1	τ
Model	Intercept & trend included in (6.5)					A linear trend excluded from (6.5)			Random walk
Hypothesis	$\gamma=0$	$\alpha_0=0$ given $\gamma=0$	$\alpha_1=0$ given $\gamma=0$	$\gamma=\alpha_1=$ $=0$	$\gamma=\alpha_1=$ $=\alpha_0=0$	$\gamma=0$	$\alpha_0=$ 0 given $\gamma=0$	$\alpha_0=$ $=\gamma=0$	$\gamma=0$
LFD (L=12)	-1.01	.895	-1.161	.01	1.31	-2.02	1.99	1.98	-.42
LNYsa[24] ($L=12^{th}$)	-5.87***	5.88***	5.66***	15.47***	11.54***	-1.61	1.62	1.32	.91
FRI_1 (L=12)	-1.20	2.25	-1.79	1.61	1.71	-1.47	1.37	.93	-.53
FRI_2 (L=12)	-1.47	2.06	-1.46	.14	.28	-1.59	1.45	.15	-.66
R (L=1)	-2.89	-0.55	-0.9	.03	1.29	-2.91**	-1.23	1.95	-2.63***
DEV (L=1)	-3.04**	1.54	-.41	.09	1.44	-3.07**	2.05*	2.09	-2.25**

Table 6.1: Results of ADF test for the presence of a unit root in level[25]

[23] While for DEV series the value of τ_α allows rejecting the null hypothesis $\alpha_0=0$ at 10 % level of significance, the value of ϕ_1 does not appear statistically significant to reject the H0: $\alpha_0=\gamma=0$.

[24] LNYsa is a seasonally adjusted natural logarithm of real GDP per capita; since only the AR at lag 12 is significant, there is no need to include all the AR terms up to 12 into the regression, but only the 12^{th} lagged differences.

[25] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NBB during our meeting in March 2003; Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. *** = reject the null hypothesis at the 1 % level; ** = reject the null hypothesis at the 5 % level; * = reject the null hypothesis at the 10 % level. L in parentheses denotes a number of lagged differences. For the detailed description of the Dickey-Fuller and the Augmented Dickey-Fuller tests and for the interpretation of the labels denoting tau-statistics see appendix E.

As a rule of thumb a non-stationary series becomes stationary after taking its first differences. Table 6.2 summarises the results of the unit root test for LFD and FRI variables in first differences. The null hypothesis of a unit root can be rejected at the 1 % level of significance. Moreover, the estimated ADF regression for both series represents a random walk model, because neither an intercept nor a linear trend are statistically significant.

Variables /Test statistic	τ_τ	$\tau_{\alpha\tau}$	$\tau_{\beta\tau}$	ϕ_3	ϕ_2	τ_μ	$\tau_{\alpha\mu}$	ϕ_1	τ
Model	Intercept & trend included in (6.6)					A linear trend excluded from (6.6)			Random walk
Hypothesis	$\gamma = 0$	$\alpha_0 =$ 0 given $\gamma = 0$	$\alpha_1 = 0$ given $\gamma = 0$	$\gamma = \alpha_1 =$ =0	$\gamma = \alpha_1 =$ $= \alpha_0 = 0$	$\gamma = 0$	$\alpha_0 =$ 0 given $\gamma = 0$	$\alpha_0 =$ $= \gamma =$ 0	$\gamma = 0$
LFD (L=11)	-11.51***	-1.77	1.77	1.57	1.08	-11.23***	-.34	0.06	-11.3***
FRI_1 (L=1)	-7.93***	.93	-.99	.49	.33	-7.88***	.12	.008	-7.92***
FRI_2 (L=11th)[26]	-8.66***	.75	-.79	.31	.21	-8.64***	.53	.0001	-8.7***

Table 6.2: Results of ADF test for the presence of a unit root in first differences[27]

Diagnostic tests (see table 6.3) performed to check whether the residuals are white noise highlight the problem of normality in FRI_2, R and DEV series. This suggests a structural change in the data that can be also traced by the graphic analysis of the data. Therefore, the conclusion of the absence of a unit root in these series can be biased. For the plausibility of the results we will test all the series for a unit root, allowing for a structural change in them.

[26] Since only the AR at lag 11 is significant, there is no need to include all the AR terms up to 11 into the regression, but only the 11th lagged differences.

[27] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NBB during our meeting in March 2003; Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. *** = reject the null hypothesis at the 1% level; ** = reject the null hypothesis at the 5 % level; * = reject the null hypothesis at the 10 % level. L in parentheses denotes a number of lagged differences. For the detailed description of the Dickey-Fuller and the Augmented Dickey-Fuller tests and for the interpretation of the labels denoting tau-statistics see appendix E.

Variables /Diagnostic Tests χ^2 [Pr]	Serial Correlation	Normality	Heteroscedasticity
LFD (L=11) I(1)	χ^2 (12)=10.06 [.611]	χ^2 (2)= .972[.615]	χ^2 (1)= .353[.553]
LNYsa (L=12th) I(0)	χ^2 (12)=14.10[.294]	χ^2 (2)= 2.78[.249]	χ^2 (1)= .408[.523]
FRI_1 (L=1) I(1)	χ^2 (12)=15.96 [.193]	χ^2 (2)= 2.43[.297]	χ^2 (1)= .752[.386]
FRI_2 (L=11th) I(1)	χ^2 (12)=12.81 [.383]	**χ^2 (2)= 20.85[.000]**	χ^2 (1)= .205[.650]
R (L=1) I(0)	χ^2 (12)= 13.93[.305]	**χ^2 (2)= 134.49[.000]**	χ^2 (1)= .029[.864]
DEV (L=1) I(0)	χ^2 (12)= 5.88[.922]	**χ^2 (2)= 269.33[.000]**	χ^2 (1)= 3.5[.061]

Table 6.3: Summary of diagnostic tests[28]

Zivot and Andrews' (1992) methodology is employed to perform a unit root test with the presence of a structural change. It allows us to treat the breakpoint as endogenous or unknown [29]. Table 6.4 presents the results of the Zivot-Andrews test.

[28] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NBB during our meeting in March 2003; Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. A number of lagged differences L is in parentheses; p-values are given in square brackets; I(x) indicates the level of stationarity. P-values are given in square brackets.

[29] In chapter 7 we use different methodologies to perform a unit root test allowing for a structural break. They are Perron's (1989) test with a known breakpoint and Banerjee's *et al.* (1992) test with unknown timing of the break. While Zivot-Andrews' test is now incorporated in some of the econometric packages (in the present case it was performed utilizing WinRATS-32 version 5.04), the aforementioned tests envisage rather a very routine procedure (virtually 'manual') to run them (see appendix E for a description of the aforementioned tests).

Variables	Minimum t statistic/time of break		
	Shift in intercept	**Shift in trend**	**Shift in both trend and intercept**
LFD (L=1)	-3.93 1995:09	-3.93 1995:09	-3.93 1995:09
LNYsa (L=0)	-8.15*** 1997:06	-7.66*** 1998:04	-8.16*** 1997:06
FRI_1 (L=1)	-3.93 1995:09	-5.1*** 1998:11	-6.002*** 1998:09
FRI_2 (L=0)	-3.23 2000:01	-4.19 1998:11	-5.02 1998:09
R (L=1)	-4.59 2000:02	-4.78** 1998:11	-5.59*** 1998:9
DEV (L=1)	-4.07 1998:08	-4.07 1998:11	-4.92 1998:08
Critical values			
[1 %]	**-5.34**	**-4.93**	**-5.57**
[5 %]	**-4.80**	**-4.42**	**-5.08**

Table 6.4: Results of Zivot-Andrews' unit root test in the presence of a structural change[30]

The results presented in table 6.4 confirm that a natural logarithm of real GDP per capita appears to be I(0) series. Moreover, the real deposit interest rate could also be treated as I(0) rather than I(1) variable if we allow for a structural change in the data in both intercept and trend in the aftermath of the financial crisis in Russia. The breakpoint picked up in intercept of R in February 2000 for which the minimum t-statistic does not reject the null hypothesis of a unit root can neither be explained rationally nor be supported graphically. As a result of the test, the rate of devaluation turned out to be I(1), whereas the ADF suggested it to be stationary in level. However, the graphic examination of the series suggests it to be I (0). Here, it should be noted that the Zivot-Andrew test allows for only one exogenous break in a series, whereas the graph suggests the series to have more than two structural breaks in levels. A two-break test

[30] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NBB during our meeting in March 2003; Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. *** = reject the null hypothesis at the 1% level; ** = reject the null hypothesis at the 5 % level.

designed by Lumsdaine and Papell (1997) also cannot be applied here, as the number of breaks in series exceeds two. Therefore, for our further analysis we will treat DEV series as I(0).

The results of the Zivot-Andrew test are also different from the ADF test results for FRI_1 that appears to be I(0) if we allow for a structural break in series around the dates of the financial crisis in Russia. At the same time the unit root hypothesis cannot be rejected for FRI_2. Compared to FRI_1 series, FRI_2 exhibits a spikier pattern with financial repression rocketing up in August-October 1998. The results of a unit root test in the presence of a structural change for LFD series are in line with the ADF test results. Summarising the results of both unit root tests performed, we conclude that LFD and FRI_2 series appear to be stationary in first differences, while LNYsa, FRI_1, DEV and R are stationary in level. Moreover, the results of Zivot-Andrews's test suggest a clear break in intercept/or trend/or both present in at least three series. It occurred in the aftermath of the financial crisis in Russia. The results of the test suggest the breakpoint to fall within September-December 1998. Therefore, the latter has to be incorporated into the model as a dummy variable D to capture an impact of financial crisis in Russia on financial depth in Belarus (see below for the values this variable will take)[31].

6.4.2 Estimating the Impact of Financial Repression on Financial Deepening

The unit root analysis suggests that we can use cointegration techniques such as the autoregressive distributed lag (ARDL) approach to cointegration or the 'bounds test', developed in Pesaran et al. (2001). This approach does not require us to know whether the variables are integrated of order I(1) or I(0). The ARDL procedure envisages two stages. The first stage involves checking for the existence of long-run relation between the variables, based on computing the F-statistic for testing the significance of the lagged levels of the variables in the error-correction form of the ARDL.

Depending on the chosen order of lags, the error-correction form of the ARDL is as follows:

[31] While estimating the final model other breaks mentioned in the text were included in the regression to test their significance. None of them appears to be statistically significant in explaining financial depth. It should be noted that they are statistically significant only in individual regressions explaining, say, the devaluation rate or real income in terms of other variables, while testing for long-run relations in ARDL approach to cointegration procedure or performing a Hausman test. That is why we include only one dummy variable, denoting financial crisis in Russia, in a final regression.

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{n} \alpha_2 \Delta Y_{t-i} + \sum_{j=0}^{m} \alpha_3 \Delta X_{t-j} + \delta_1 y_{t-1} + \delta_2 x_{t-1} + u_t, \qquad (6.7)$$

where δ_1 and δ_2 are long-run coefficients and α_2 and α_3 are short-run coefficients, α_0 is a drift term and α_1 is a time trend, n and m denote the maximum order of the lags of ΔY and ΔX respectively (for definition of Y and X see (6.8)).

The null hypothesis is that of 'non-existence' of the long-run relationship, to be defined as follows: H0: $\delta_1 = \delta_2 = 0$ against H1: $\delta_1 \neq \delta_2 \neq 0$. Here the ordinary F statistic is used to test the joint significance of these coefficients. The computed F-statistics are compared with the critical values developed by Pesaran et al. (2001). There are two sets of critical values. One is calculated assuming that all ARDL variables are of I(1), while the other assumes all the variables are I(0). If the F statistic falls outside this band of critical values, one can draw conclusions without knowing whether the variables are I(1) or I(0) (Pesaran et al. 2001). The same procedure is repeated for testing the significance of the other lagged level variables by regressing ΔX on the same regressors of equation (6.7).

The second stage includes estimating the long-run coefficients and the associated error-correction model (for more details see Pesaran 1997, Pesaran et al 2001).

In order to examine the existence of a long-run relationship in equation (6.4) we estimate a conditional error correction model of financial depth (6.8) for the number of lags of the VAR model. We assume that the expected rate of devaluation is on average equal to the actual rate of devaluation.

$$\Delta LFD_t = \alpha_0 + \sum_{i=1}^{11} \alpha_2 \Delta LFD_{t-i} + \sum_{j=0}^{7} \alpha_3 \Delta FRI1_{t-j} + \sum_{j=0}^{1} \alpha_4 \Delta \ln Ysa_{t-j} + \sum_{j=0}^{1} \alpha_5 \Delta DEV_{t-j} +$$

$$+ \sum_{j=0}^{2} \alpha_6 \Delta R_{t-j} + \delta_1 LFD_{t-1} + \delta_2 FRI1_{t-1} + \delta_3 \ln Ysa_{t-1} + \delta_4 DEV_{t-1} + \delta_6 R_{t-1} + DU98 + u_t \quad (6.8)$$

where DU98=1 if time of break= August 1998 - December 1998 and 0 otherwise.

The lag order of the financial depth equation was chosen on the basis of the model selection criteria and providing residuals are white noise. This resulted in the choice of an ARDL (11, 7, 1, 1, 2) specification without trend (see (6.8)). The F statistic computed to test the joint significance of long-run coefficients δ_i is equal to F(LFD|FRI_1, LNYsa, DEV, R) = 16.4572[.000] that rejects the null hypothesis of 'non-

existence' of the long-run relationship between LFD, FRI_1, LNYsa , DEV and R at the 1 % level of significance[32].

The same procedure was applied to test the significance of explanatory lagged level variables in the error correction model, in explaining their first differences. As discussed above if F statistics for testing the joint significance of the lagged level variables fall below the lower bound of the critical value band provided by Pesaran et al. (2001) it implies that they do not enter significantly in the equations for ΔLNYsa, ΔFRI, ΔR, and ΔDEV and therefore they can be treated as 'long-run forcing' variables. This procedure, first applied to the real GDP per capita series, resulted in rejecting the H0 of LNYsa being a 'long-run forcing' variable for the explanation of financial depth. The F statistic[33] exceeds the upper bound of the critical value band at the 1 % level of significance, implying the problem of endogeneity of the real GDP per capita variable. The procedure was applied to other three explanatory variables. The null hypothesis of FRI_1 being a 'long-run forcing' variable cannot be rejected at the 1 % level of significance[34]. However, we fail to reject it for FRI_2, R and DEV[35].

These results suggest that there exist more than one cointegrating relationship in the financial depth equation. A further application of the ARDL procedure is inappropriate in estimating the financial depth equation, because the ARDL technique is based on estimating a single equation, while dealing with situations where there can be more than one level relationship, as in our case, is a matter of employing the VAR model.

Following the unit root analysis we have only FRI_2 as an explanatory variable that is first differences stationary. Therefore, FRI_2 is the only variable that can be potentially cointegrated with the dependent variable denoting financial depth. With a

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[32] Critical value bounds of the F statistic with unrestricted intercept and no trend at the 1 % level of significance are: I(0) 3.817 and I(1) 5.122. We also tested for existence of long-run relationship between LFD, LNYsa , DEV, R and FRI_1 replaced with FRI_2. The H0 of 'non-existence' of the long-run relationship was rejected at the 1 % level of significance (Fst = 12.33 [0.000] (Pesaran et al. 2001, pp. T.1-T.3).

[33] F(LNYsa|LFD, FRI_1, DEV, R) = 6.44[.000] Critical value bounds of the F statistic with unrestricted intercept and trend at the 1 % level of significance are: I(0) 4.40 and I(1) 5.72 (ibid).

[34] F(FRI_1|LFD, LNYsa, DEV, R) st. = 3.43[.008] Critical value bounds of the F statistic with unrestricted intercept and trend at the 1 % level of significance are: I(0) 4.40 and I(1) 5.72 (ibid).

[35] F(FRI_2|LFD, LNYsa, DEV, R) st. = 4.62[.001] Critical value bounds of the F statistic with unrestricted intercept and trend at the 5 % level of significance are: I(0) 3.47 and I(1) 4.57; F(R|LFD, LNYsa, DEV, FRI_1) st. = 4.8 [.001] Critical value bounds of the F statistic with unrestricted intercept and no trend at the 5 % level of significance are: I(0) 2.86 and I(1) 4.01; F(DEV|LFD, LNYsa, FRI_1, R) st. = 27.44[.000] Critical value bounds of the F statistic with unrestricted intercept and trend at the 1 % level of significance are: I(0) 4.40 and I(1) 5.72 (ibid).

view to employing the Johansen cointegration procedure,[36] the inclusion of level stationary series in a cointegrated space is visible following the arguments developed by Rahbek and Mosconi (1999)[37]. However, in the present circumstances it is not advisable, as the results can be spurious and hard to interpret, suggesting more than one cointegration relationship when, in fact, there exists only one true cointegration relationship. This is because the number of cointegrated relationships increases with every stationary variable included. Moreover, the inclusion of a dummy variable to capture the impact of financial crisis in Russia will affect the distribution of the test statistics, such that the critical values for these tests reported by software can lead to biased results. Finally, the Johansen cointegration procedure does not have good small samples properties; it tends to over-reject when the null hypothesis is true (see Harris 1995, p.88).

Therefore, we have to abandon the use of cointegration techniques in estimating equation 6.4. In turn, we will use OLS procedure by taking the first differences of the dependent variable, LFD, and explanatory variable, FRI_2, to make them stationary. Other variables enter the equation in levels. In particular, an Autoregressive Distributed Lag (ADL) model is going to be utilised here in order to capture the dynamics in the series. The estimated coefficients of the explanatory variables will take on the interpretation of their impact on financial deepening during the evaluation period. Unlike cointegration techniques, the use of the ADL model will not allow us to draw any separate inferences about the short-run and long-run effects that the explanatory variables exerted on financial deepening. Before utilising the ADL estimator we tested all the series for weak exogeneity following the problem of endogeneity identified earlier. A Hausman test was performed. We run an auxiliary regression with application to the real GDP series (financial repression index, the rate of devaluation and the real deposit interest rate) of the kind of ADL model specified below (6.11). We introduced the first differences of the financial depth variable and of the principal components financial repression index in equation 6.11, for the OLS estimates to be valid. The logarithms of the real government expenditures per capita and of the real industrial output per capita were used as instrumental variables for the real income series with the other variables treated as exogenous or predetermined. The current and the lagged values of the inflation series

[36] For a discussion of the procedure see chapter 7.

[37] Rahbek and Mosconi (1999) contend that the inclusion of the accumulated stationary explanatory regressors in the error correction term will not affect the distribution of the test statistics.

were used as instrumental variables for the real deposit interest rate, the devaluation rate and for the index of financial repression. The retrieved residuals from the estimated regression were included in the model of financial deepening (6.11). The coefficient of the variable denoting residuals from estimated equation 6.11 appears to be statistically insignificant for all the tested series[38], implying that the OLS estimates are consistent and the real GDP per capita, the financial repression index, the real deposit interest rate and the rate of devaluation series are determined outside the system under analysis or in other words exogenously. The latter is confirmed by the Granger-Causality test. To perform this test we run bivariate regressions (6.9) in Eviews for all pairs of (LFD, X) series, specifying LFD in the first differences for the OLS estimates to be consistent:

$$LFD_t = \alpha_0 + \alpha_1 LFD_{t-1} + ... + \alpha_l LFD_{t-l} + \beta_1 X_{t-1} + ... + \beta_l X_{t-l} + u_t \quad (6.9)$$

$$X_t = \alpha_0 + \alpha_1 X_{t-1} + ... + \alpha_l X_{t-l} + \beta_1 LFD_{t-1} + ... + \beta_l LFD_{t-l} + u_t,$$

In each of the regressions X represents LNYsa, FRI, DEV and R respectively. L denotes a lag length, equal to12 in the present case, given our monthly data. The reported F-statistics in Eviews are the Wald statistics for the joint H0 hypothesis:

$$\beta_1 = \beta_2 = ... = \beta_l = 0 \quad (6.10)$$

Following the results of the test only the real deposit interest rate appears to be determined endogenously. Thus, the H0 of the first differences of LFD not Granger causing R can be rejected at the 1 % level of statistical significance (Fst. =3.02). The H0 of R not Granger causing the first differences of LFD can be rejected at the 5 % level of statistical significance (Fst. =1.96). This suggests a two-way relationship between the interest rate and the first differences of LFD, although the latter was not confirmed by the results of the Hausman test.

The real GDP per capita series, a variable of particular interest for the second part of the analysis (evaluating the impact of financial repression through financial deepening on economic growth), turns to be exogenous with regard to the first differences of financial depth variable, implying the former Granger causing the latter. The H0 of the first differences of LFD not Granger causing LNYsa cannot be rejected at any levels of statistical significance (Fst. =.32, p-value= .96). The H0 of LNYsa not Granger causing the first differences of LFD can be rejected at the 10 % level of statistical significance (Fst. =1.83).

[38] The p-values for the coefficients of residuals for LNYsa, FRI_1, FRI_2, DEV and R regressions are respectively equal to .167, .515, .803, .737 and .543 and therefore H0 of exogeneity cannot be rejected.

This difference in the results obtained in performing a test for exogeneity within ARDL approach to cointegration and the Hausman and Granger-causality tests may be explained by the fact that in the first instance a levels specification of LFD was used, while in the second case LFD was specified in differences.
The ADL model is specified as follows.

$$LFD_t = \alpha_0 + \alpha_1 t + \alpha_2 LFD_{t-1} + \alpha_3 LFD_{t-2} + ... + \beta_1 LNYsa_t + \beta_2 LNYsa_{t-1} + ... + \delta_1 FRI_t + \\ + \delta_2 FRI_{t-1} + ... + \phi_1 R_t + \phi_2 R_{t-1} + ... + \mu_1 DEV_t + \mu_2 DEV_{t-1} + \gamma_1 DU98 + u_t \quad (6.11)$$

The expected rate of devaluation in the equation is proxied by the actual rate of devaluation[39].

The appropriate lag-length is chosen by the general-to-specific approach advocated by Hendry (1995). Given our monthly data we start with 12 lags and then use unit reductions to achieve the highest values of AIC and SBC (model selection criteria), consistent with white noise residuals. This results in the choice of an ADL [(1, 12), 2, (1, 3) 1, 1] specification, where (1, 12) means that only the first and the twelfth of ΔLFD series are included in the equation, as they are the only ones that appear to be statistically significant and their inclusion is required to overcome a problem of serial correlation in the residuals. The choice of the first and the third lags for the FRI_1 series can be similarly explained. To overcome a problem of endogeneity of the real deposit interest rate, identified by the Granger-causality test, we first run the Generalised Instrumental Variable Method[40]. The deposit real interest rate was regressed on a set of instruments that were closely correlated with it, but uncorrelated with an error term. Along with the right-hand side predetermined (exogenous) variables the current and twice lagged values of the inflation rate were used as instrumental variables for R. The results of the model estimation appeared to be very much similar to the OLS regression estimation reported in table 6.5. Since the Hausman specification did not confirm the endogeneity of R, we are inclined to regard it as determined exogenously. The results of estimating model (6.11) by Two-stage Least Squares methodology are reported in appendix D.

[39] In fact, hypothesising the prevalence of rational expectations in the formation of the rate of devaluation of the national currency, we pre-estimated the model by using the Generalised Instrumental Variable Method to account for a problem of measurement errors (see section 7.4.3 for a description of the methodology). Twice lagged values of the devaluation rate were used as instrumental variables. The results were unsatisfactory, with Sargan's χ^2 statistic indicating model misspecification and inappropriate instrumental variables.

[40] See section 7.4.3 for a detailed discussion of the methodology.

α_0 (intercept)	α_1 (trend)	β_1 (LNYsa)	δ_1 (FRI_1)	ϕ_1 (R)	μ_1 (DEV)	γ_1 (DU98)	Adj. R sq.	Diagnostic tests
-14.09 (3.25) P-value [.000]	-.0089 (.002) P-value [.000]	.48 (0.26) P-value [.065]	-.0011 (.0003) P-value [.003]	-.0019 (.0006) P-value [0.002]	-.002 (.0017) P-value [.183]	-.123 (.049) P-value [.015]	.69	Serial Correlation: $\chi^2(12)= 15.6$ [.212] Functional Form: $\chi^2(1)= 2.36$ [.124] Normality: $\chi^2(1)= 2.12$ [.347] Heteroscedasticity: $\chi^2(1)= .014$[.706]

Table 6.5: Summary of the results of estimating model (6.11) with FRI_1[41]

The empirical performance of the model is satisfactory. It passes diagnostic tests. All the coefficients with the exception of the rate of devaluation appear to be statistically significant. All but the interest rate variable have the expected signs. Theoretically, a real deposit interest rate should be positively correlated with financial deepening. Imposition of financial restraints should affect only the significance of this variable (reducing it), but not the direction of the relationship. However, the results above show that the real deposit interest rate in Belarus was negatively correlated with financial depth. This may suggest that its repression was particularly severe. At the same time, given high correlation between the rate of devaluation, the real deposit interest rate and the FR index[42], a negative sign of the coefficient for the real deposit interest rate can be attributed to multicollinearity in the model. To check this we perform some sensitivity analysis to see whether the estimates are different when 1) the rate of devaluation is removed from the equation, and 2) when the deposit rate ceiling is removed when constructing the index of financial repression. Table 6.6 reports the results.

[41] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NBB during our meeting in March 2003; Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Standard errors are in round parentheses. To save space p-values are used here and thereafter instead of asterisks to denote statistical significance of the coefficients.

[42] The Pearson correlation coefficient is equal to .66 for the rate of devaluation and the real deposit interest rate, -.68 for the rate of devaluation and the FR index, and -.82 for the real deposit interest rate and FR index.

α_0 (intercept)	α_1 (trend)	β_1 (LNYsa)	δ_1 (FRI_1)	ϕ_1 (R)	γ_1 (DU98)	Adj. R sq.	Diagnostic tests
-12.7	-.008	.44	-.001	-.002	-.10	.67	Serial Correlation:
(3.09)	(.002)	(0.26)	(.0003)	(.0005)	(.04)		χ^2 (12)= 16.1 [.19]
P-value	P-value	P-value	P-value	P-value	P-value		Functional Form:
[.000]	[.000]	[.097]	[.000]	[0.002]	[.019]		χ^2 (1)= 1.02 [.312]
							Normality:
							χ^2 (1)= 1.5 [.48]
							Heteroscedasticity:
							χ^2 (1)= .03[.86]

Table 6.6: Summary of the results of re-estimated model (6.11)[43]

As one can see from table 6.6 the estimates are not much different from the ones obtained earlier. So, both the sign and magnitude of the coefficient for the real interest rate are upheld. This suggests that the negative coefficient for the real interest rate is more likely to reflect a poor instrument. Indeed, even when the deposit interest rate was rising in real terms, it still remained negative through most of the period. So households had no incentive to switch from investing in tangible assets and foreign currency (cash), to depositing their earnings in banks. Furthermore, the FRI also exerts a direct negative impact on financial deepening that is independent of FR influence through the real deposit rate of interest, and it is statistically significant at the 1% level.

We also run a regression for the first differences of FRI_2 inclusive into regression explaining financial deepening. The ADL is specified as follows [(12), 1, (1, 3) 1, 1] (see table 6.7).

[43] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NBB during our meeting in March 2003; Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Standard errors are in round parentheses.

α_0 (inter.)	α_1 (trend)	β_1 (LNYsa)	δ_1 (FRI_2)	ϕ_1 (R)	μ_1 (DEV)	γ_1 (DU98)	Adj. R sq.	Diagnostic tests
-6.6	-.004	.353	-.0004	-.0016	-.0046	-.076	.65	Serial Correlation:
(2.16)	(.001)	(0.247)	(.00024)	(.00074)	(.0016)	(.05)		$\chi^2(12)= 22.2$ [.035]
P-value	P-value	P-value	P-value	P-value	P-value	P-value		Functional Form:
[.003]	[.011]	[.157]	[.071]	[0.0027]	[.005]	[.134]		$\chi^2(1)= 2.50$ [.113]
								Normality:
								$\chi^2(1)= .187$ [.911]
								Heteroscedasticity:
								$\chi^2(1)= .132$[.716]

Table 6.7: Summary of the results of estimating model (6.11) with FRI_2[44]

The results presented in table 6.7 are less satisfactory than in the case of the arithmetic average measure of financial restraints (FRI_1) used in the regression. First of all, the estimated model does not pass a test for a serial correlation. Second, the index of FR computed on the basis of principal components analysis appears to be statistically significant only at the 10 % level of significance. This lower level of significance can be explained by the fact that the effect is shared between the FRI and the rate of devaluation of the national currency. The latter appears to be statistically significant in explaining financial deepening. However, it should be noted that the results do not pass the test for serial correlation in residuals at the 5 % level of significance and therefore can be biased.

In summary, our findings suggest that financial repression in Belarus had an overall negative impact on financial deepening. Financial disintermediation could have had negative implications for economic growth in the long run, if the financial structure had mattered. In the case of Belarus, it seems likely that it did not, but given the estimation technique we can talk only about its contemporaneous effect (for a detailed discussion of the impact of the Belarusian financial policy on the economic growth see chapter 8).

[44] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NBB during our meeting in March 2003; Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Standard errors are in round parentheses.

The main purpose of this chapter has been to present the empirical evidence of the impact of financial repression on financial deepening in Belarus from 1995-2002. The evidence reveals that, first of all, the restraints imposed on the financial sector in Belarus over 1996-2000 can be dubbed financial repression. Second, financial repression, measured as an index incorporating four major financial repressionist policies, had an overall negative contemporaneous effect on financial deepening.

We believe that it is unlikely that finance played any significant role in explaining the economic growth in Belarus. The theoretical arguments on the finance-growth nexus suggest that there is a positive association between them. Our empirical analysis revealed that Belarus had experienced financial disintermediation in the period under examination, and this could not have contributed positively to economic growth. We envisage that the results of the model could be more parsimonious if we were to account for the problem of the extensive use of monetary surrogates in the economy. If we were to speculate on this, we would expect the monetised part of real GDP series to be better associated with financial depth in Belarus. Moreover, it could also be the case that there was a bi-directional relationship between finance and GDP, allowing for endogenous economic growth to take place.

Chapter 7 Seigniorage and Inflation Tax as Complementarities of Financial Repression

As outlined in chapter 2 in the literature on financial development, along with the concept of financial repression (FR) itself, important attention is drawn to the concepts of seigniorage (S) and the inflation tax (IT). However, neither S nor IT are considered instruments of FR. All three concepts appear to be complementary in considering the issue of implicit taxation of the financial system. Section 7.1 distinguishes all three concepts and outlines the ways of their interaction.

Money creation remained the main source for financing budget deficits in all transition economies during the early stages of transformation. Consequently, the economic gains from money creation came in the form of seigniorage and inflation tax. Despite the de-jure independence of the central banks created in the transition economies, de-facto they remained under the control of the government during the early stage of transition. This permitted them to print money, to finance government expenditures with seigniorage.

Inflation is considered to be a monetary phenomenon in the sense that a continuous increase in the general price level is due to monetary expansion creating an excess of money supply over its actual demand. While acknowledging that emission policy has remained the dominant monetary instrument in some transition economies like Belarus and Turkmenistan over the years of transition, the majority of other transition economies, such as the majority of Central European countries, realising the inflationary nature of money creation, have switched to using more market instruments to carry out monetary policy. Consequently, by reducing money emission, these countries have limited the gains from seigniorage and the inflation tax, while Belarus, for example, tried to benefit from them. However, since inflation tax is a tax, there exists a maximum point at which it is optimised under a certain rate of money growth that can be called the revenue-maximizing rate.

Section 7.2 draws on a methodological framework to define the revenue-maximizing rate of money growth optimising tax on real balances. Then, the productivity of the tax is analysed by comparing the actually raised revenue from the inflation tax with the revenue that could be raised if the quantity of money had risen at a constant rate.

Section 7.3 specifies the model of demand for money that is used to estimate the maximum revenue the government can gain from money printing under steady-state conditions.

Section 7.4 reports the empirical results. The contribution of this section is in the unique approach in treating the data. We use sophisticated econometric techniques in testing the series for unit root. The results of applying the standard Augmented Dickey-Fuller test show that it is not able to capture the impact of structural breaks in the data. The research that has been done on money demand in Belarus so far does not account for structural breaks. That leads to the incorrect treatment of the data regarding them as I(1) rather than I(0). Moreover, we do not confine our analysis to using Perron's methodology, which allows correcting the data for structural breaks exogenously, and in turn can lead to over rejection of the unit root hypothesis. We also apply Banerjee's et al (1992) and Zivot and Andrews' (1992) methodologies that allow searching for endogenous breaks in series.

For the robustness of the results, we use the two-fold approach to estimating our final regression. Assuming all series are I(0), the first approach is to estimate a Partial Adjustment Model (PAM), while the second one is an Autoregressive Distributed Lag (ARDL) approach to cointegration, which does not require us to know whether the variables are integrated of order I(1) or I(0).

The main findings follow in conclusion.

7.1 Distinction and Interaction between Financial Repression, Seigniorage and Inflation Tax

In the literature on financial development, along with the concept of financial repression itself, significant attention is focussed on the concepts of seigniorage (S) and inflation tax (IT). However, neither S nor IT are considered instruments of FR. In the first place it is necessary to introduce the concepts of seigniorage and inflation tax to see later how they can be related to financial repression.

Seigniorage is the revenue that government collects from printing money. It can be expressed as follows:

$$\text{SE} = g_m\left(\frac{M_t}{P_t}\right) = \frac{M_t - M_{t-1}}{P_t} = \left[\frac{M_t - M_{t-1}}{M_{t-1}}\right]\left(\frac{M_t}{P_t}\right) \tag{7.1}$$

where

$g_m = \frac{M_t - M_{t-1}}{M_{t-1}}$ - money growth,

M – nominal monetary base,

P- price level, measured as the consumer price index,

$\left(\frac{M}{P}\right)$ - real money balances.

The inflation tax is literally a tax on nominal assets[1]. Since most of government debt takes the form of non-indexed nominal assets, the value of that debt is eroded when prices rise. In turn debt-holders suffer a capital loss. Thus, inflation tax are losses which money holders incur as a result of inflation caused by significant increases in the quantity of money. It is measured as:

$$\text{IT} = \left[\frac{(P_t - P_{t-1})}{P_{t-1}}\right]\left(\frac{M_t}{P_t}\right), \tag{7.2}$$

where the tax rate is the inflation rate: $\pi = \frac{P_t - P_{t-1}}{P_{t-1}}$

There exist some alternative measures of the tax rate. The above one is a conventional definition of inflation, which is usually applied. Easterly et al. (1995), Sachs and Larrain (1992), Calvo and Leiderman (1992) define it as $\left[\frac{\pi}{1+\pi}\right]$. In our estimations of inflation tax we use the conventional definition of inflation rate.

Seigniorage and inflation tax are closely related concepts, and sometimes there is no clear distinction. That is, in the economic literature both terms are often used interchangeably. For example, Romer (1996), Aschauer (1997), Boichanka (2001) etc.

[1] Here it should be borne in mind that the inflation tax base is high-powered money (M_0). For a discussion of this issue see below.

use seigniorage as the common term defining the tax on real cash balances. Cagan (1956) uses the definition of the inflation tax while estimating the government gains on printing money.

Seigniorage can be expressed as the sum of the inflation tax on the monetary base and the increase in the real stock of monetary base (see for example Cagan 1956, Easterly et al. 1995, Blanchard and Fischer 1990). That is,

$$\frac{\partial M}{\partial t}\frac{1}{P} = \frac{M}{P}\left(\frac{\partial P}{\partial t}\frac{1}{P}\right) + \frac{\partial\left(\frac{M}{P}\right)}{\partial t}, \tag{7.3}$$

When real money balances are constant over time, that is $\frac{M_t}{P_t} = \frac{M_{t-1}}{P_{t-1}}$, seigniorage and inflation tax are equal.

Getting back to the issue of the interrelation of all three concepts, namely inflation tax, seigniorage and financial repression, it follows that they are all regarded as forms of implicit discriminatory taxation of the economy, and particularly the financial system. The complementarities between them lie in the following: 1) interest savings on government liabilities can be obtained through the inflation policy that, given nominal interest rate ceilings, implies very low real interest rates; 2) imposition of reserve requirements, one of the instruments of FR, increases directly the IT base; 3) a limited choice of financial instruments and low or negative real interest rates increase money demand, in this way augmenting the IT base (Giovanni and De Melo 1993, p. 955).

(7.2) embodies the classical approach to IT. However, in some empirical studies, other monetary aggregates are used as the IT tax base. For example, should distortions in real interest rates (under condition of nominal interest-ceilings) due to inflation be included as part of IT or as FR. Giovannini and de Melo (1993) argue that it is incorrect to relate them to IT because the inflation tax base is high-powered money, while financial repression affects the portfolio of non-monetary assets held by domestic residents.

Giovannini and de Melo (1993) argue it is to be expected that an inflation tax will be used together with financial repression. In turn, Fry (1995) argues that in classic cases of financial repression, the proliferation of financial instruments from which governments can extract seigniorage is encouraged. For example, this can be done

through imposing taxes on private securities markets, because seigniorage cannot be easily extracted from these markets (Fry 1995, pp. 20-22).

Basically, what becomes clear from the above is that all three concepts appeared to be complementary in considering the issue of implicit taxation of the financial system[2]. However, seigniorage seems often disregarded in discussions of FR, while preference is given to IT. This is likely because financing a budget deficit by printing money is virtually costless itself unless it turns into the source of inflationary financing, which is when an increase in money supply is not supported by output growth. Here, seigniorage and inflation tax go hand-in-hand, and the greater use of seigniorage results in faster money growth, and eventually in higher inflation.

Further, Makinen and Woodward (1990) argue that the complementarity between FR and IT breaks down under very high rates of inflation. Since the legal tender is losing its credibility very quickly under high inflation, households tend to divert their domestic assets into primarily foreign assets. In this case, financial repression and inflation tax become substitutes.

The next section considers the theory of the optimal tax on real balances and consequently its revenue-maximizing money growth rate.

7.2 Conceptual Framework of Defining the Optimal Seigniorage

Assuming that the economy is initially in a steady state, seigniorage, regarded as a tax, graphically can be represented as a Laffer curve with respect to the rate of money growth. It initially rises and then falls with higher inflation. Figure 7.1 represents the bell-shaped form of the seigniorage Laffer curve. There is a maximum point at which seigniorage is optimised under a certain rate of money growth that can be called the revenue-maximizing rate of money growth. Under more moderate rates of money growth - less than the revenue-maximizing one - seigniorage exhibits an upward trend. When a money growth rate exceeds the revenue-maximizing one, the inflation rate increases in greater proportion than the money growth rate. This finally leads to the decline in real cash balances or in other words to the proportionally greater reduction in the tax base for seigniorage compared with the increase in the tax rate itself. As a result the revenue declines which graphically puts seigniorage on the downward sloping side

[2] For the rationale for the use of inflation tax see chapters 2,3 and 4 where this issue was discussed for financial repression.

of the Laffer curve. Thus, basically there is a kind of trade-off between a higher rate of money growth increasing seigniorage and the associated inflation decreasing it by lowering demand for money. When government needs can be financed with seigniorage lower then the maximum rate, there exists a dual steady state equilibrium implying that the same amount of seigniorage can be obtained at low and high inflation steady state points.

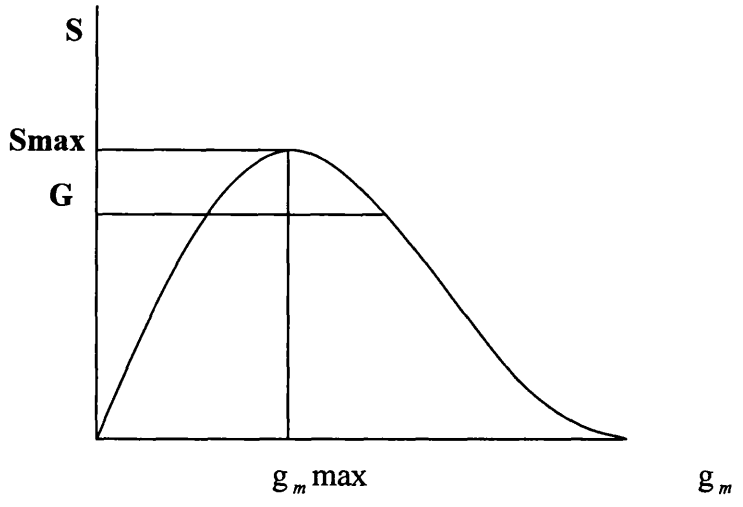

Figure 7.1: The Seigniorage (S) Laffer curve[3]

There exists a body of work on the issue of seigniorage and its optimal value. Most of these empirical studies are based on Cagan's (1956) work 'The monetary dynamics of hyperinflation'. Given that wealth in real terms and real income are relatively stable under hyperinflation, Cagan (1956) assumes that in a period of high inflation, changes in demand for real balances largely result from the extreme fluctuation in prices. That is the demand for money is rather a function of the expected rate of inflation rather than the nominal interest rate[4]. The optimal seigniorage is calculated by applying the steady-state conditions to the revenue-maximizing rate of money growth. Under steady-sate conditions, when the quantity of money rises at a constant rate, expected inflation is assumed to be equal to actual inflation, and the quantity of real balances does not change over time. This implies the equality of the rate of money growth and inflation. To consider these relations between inflation and seigniorage under steady-state conditions it is necessary to recall the money demand function under high inflation suggested by Cagan (1956, pp.33-37):

[3] The figure is adapted from Romer (1996, p.422).
[4] For more details see Cagan (1956, pp.25-117).

$$\ln\frac{M}{P} = -\alpha E - \gamma, \tag{7.4}$$

where M is an end-of-month index of the quantity of money in circulation, and P is an end-of-month index of the price level. α is a positive constant denoting the semielasticity in the demand for money with respect to the rate of inflation ; γ is a constant; E stands for the expected rate of change in prices and is assumed to be a function of the actual rate of change, C, that is in turn equal to the difference between the logarithms of successive values of the index of prices. The expected rate of inflation is expressed by the following equation:

$$\left(\frac{\partial E}{\partial t}\right)_t = \beta(C_t - E_t), \tag{7.5}$$

Converting equation (7.4) from logs and substituting in the formula of inflation tax[5] (7.2) gives:

$$R = \pi e^{-\alpha\pi-\gamma}, \tag{7.6}$$

where π – the rate of rise in prices.

Maximum seigniorage[6] can be obtained by differentiating this expression with respect to g_m, and given that this derivative is zero and the second derivative is negative:

$$\frac{\partial R}{\partial \pi} = (1-\alpha\pi)e^{-\alpha\pi-\gamma} = 0 \tag{7.7}$$

$$\frac{\partial^2 R}{\partial \pi^2} = (\alpha^2\pi - 2\alpha)e^{-\alpha\pi-\gamma} < 0 \tag{7.8}$$

These conditions are satisfied for $\pi<1/\alpha$. Here it is very important to emphasize that this maximum revenue is treated in the sense that it can be maintained indefinitely. No maximum revenue exists when the tax is first imposed; the higher the tax rate, the higher the revenue due to underestimation of inflation and consequently

[5] Here we follow Cagan's methodology deriving the maximum value of the tax on cash balances (see Cagan (1956, pp.80), where he uses the inflation rate as a tax rate. However, the terms of seigniorage and the inflation tax in this case are indeed interchangeable, as the above conditions imply their equality. So, it does not make much difference what term to refer to while deriving the optimal revenue.

[6] Here it should be noted again that seigniorage and inflation tax are used interchangeably.

gradual adjustment in real cash balances. This is the case when the government can obtain seigniorage greater than the maximum value. After households start correctly estimating expected inflation, the adjustment to their real cash balances tends to be instantaneous. Then, the higher money growth leads to higher inflation and correspondingly to a decrease in the demand for real money balances and a fall in the revenue from seigniorage.

To see that, one should assume that an adjustment of real money demand to its desired level is not instantaneous due to the existence of a lag in expectations. It implies that the actual real stock of money exceeds the desired level of real balances.

Assuming that the adjustment in real balances is not instantaneous gives an impetus to introducing a partial adjustment hypothesis:

$$\ln\left(\frac{M_t}{P_t}\right) - \ln\left(\frac{M_{t-1}}{P_{t-1}}\right) = \delta\left[\ln\left(\frac{M_t}{P_t}\right)^* - \ln\left(\frac{M_{t-1}}{P_{t-1}}\right)\right], \tag{7.9}$$

where

δ is the adjustment coefficient.

$\left(\frac{M_t}{P_t}\right)^*$ is the desired level of real money balances given by Cagan's money-demand function.

Alternatively, we can rewrite it as follows:

$$\ln\left(\frac{M_t}{P_t}\right) = \delta \ln\left(\frac{M_t}{P_t}\right)^* + (1-\delta)\ln\left(\frac{M_{t-1}}{P_{t-1}}\right), \tag{7.10}$$

That is the actual real money balances at time t is a weighted average of the desired real money balances at that time and the real money balances existing in the previous period with δ and $(1-\delta)$ being the weights.

Since

$$\ln\left(\frac{M_t}{P_t}\right) - \ln\left(\frac{M_{t-1}}{P_{t-1}}\right) = \frac{\partial\left(\frac{M}{P}\right)}{\partial t} = \frac{\dot{m}}{m}, \tag{7.11}$$

where $\frac{\dot{m}}{m}$ is a growth rate of real money balances, it gives us:

$$\frac{\dot{m}(t)}{m(t)} = \delta\left[\ln\left(\frac{M_t}{P_t}\right)^* - \ln\left(\frac{M_{t-1}}{P_{t-1}}\right)\right], \tag{7.12}$$

Assuming that the government needs (G) to be financed by seigniorage exceed the maximum steady-state seigniorage, Romer (1996, pp.425-26) proves that $\frac{\dot{m}}{m}<0$.[7]

Moreover, the fact that real money balances are falling implies that

$$\left[\ln\left(\frac{M_t}{P_t}\right)^* - \ln\left(\frac{M_{t-1}}{P_{t-1}}\right)\right]<0 \tag{7.13}$$

Expressing the inflation rate as $\pi=\frac{\dot{M}}{M}-\frac{\dot{m}}{m}$ (7.14) and substituting (7.12) into (7.14) gives us:

$$\pi = \frac{\dot{M}}{M} - \left[\ln\left(\frac{M_t}{P_t}\right)^* - \ln\left(\frac{M_{t-1}}{P_{t-1}}\right)\right] \tag{7.15}$$

Condition (7.13) means that the rate of inflation exceeds the rate of money growth.

The above argument implies that when the adjustment in real cash balances is gradual, government can obtain seigniorage greater than the steady-state maximum value, but only at the expense of accelerating inflation.

7.3 Specifying the Functional Form of the Money Demand Function

The procedure for estimating the optimal seigniorage under steady–state conditions described above envisages the estimation of demand for real money balances.

In a market economy, real balances are demanded as medium of exchange and a store of value. Hence real money demand maybe a function of such variables as real wealth, real income, and the opportunity coast of holding cash.

[7] Romer's (1996) calculations are also based on Cagan's money demand function specification.

$\frac{M}{P} = L(Y,i)$, where

M- nominal money balances

P- price level

Y – scaling variable representing economic activity

i – opportunity cost of holding money (nominal interest rate).

Based on these theoretical grounds a large variety of models have been developed to estimate money demand. The present work will not give a detailed review of all of these models[8]. However for further analysis of seigniorage it would be useful to mention some of the approaches to estimation of money demand, such as a static (equilibrium) model, dynamic and error-correction money demand models.

A static model can be derived from the early theories of the demand for money such as Fisher's (1911) quantity theory of money, from transactions demand theory (e.g. Keynes 1936, Baumol 1952 and Tobin 1956), from the portfolio balance approach, or from the Monetarist models based on the quantity theory of money (e.g. Friedman 1956).

The second approach to money demand function is the stock-adjustment (dynamic) model or Partial Adjustment Model (PAM). It was described in more detail in section 7.2. It assumes that an adjustment of real money demand to its desired level is not instantaneous due to the existence of the lag in expectations. It may be particularly relevant to transition economies where steady-state conditions are not always met. Following the findings of Budina, Hanousek, and Tuma (1994), who applied Cagan's money demand model to estimate the maximum level of seigniorage in the Czech Republic, Romania, Poland and Bulgaria, the static model was suitable for countries with relatively stable economic development such as the Czech Republic and Poland. But in the cases of Romania and Bulgaria, demonstrating large variation in change of prices, the results of estimation were statistically insignificant.

Boichanka (2001) estimated money demand function for Belarus, Ukraine and Russia, applying two models: the first based on Cagan's model, assuming steady-state conditions, and the second is the stock-adjustment model. His results demonstrate that only in Belarus is the semielasticity of money demand with respect to the nominal interest rate significantly different from zero at the 10 % level. However the explanatory

[8] For the systemic literature survey of money demand theories see Sriram 1999a, Boichanka 2001 and Cuthbertson and Barlow 1991.

power of the regression (R^2) was low, as was also the case for Russia and Ukraine. However the dynamic model applied to all of the three countries showed the results to be statistically significant with high R^2. Boichanka's findings on Ukraine appeared to be in line with the results of Aschauer's (1997) work on estimating the money demand for Ukraine in 1993-1996 using the stock-adjustment model of money demand.

Estimating the dynamic model in the way represented by equation 7.10 (see section 7.2) can cause problems because of high correlation between current and lagged values of the dependent variable. Then, some of the variables in the model are likely to be non-stationary which can lead to the problem of spurious or meaningless regression. The latter can be overcome by taking the first differences of the dynamic model, or in other words estimating the short-run relationships between variables. However, in this case the important information about the long-run relationships can be lost, and that in turn can make further forecast useless.

Thus, to overcome these limitations there is a need to consider the third approach to estimating money demand functions that is the error-correction model (ECM) that incorporates both short-run and long-run effects. The latter has been used a lot in the recent empirical studies on money demand estimation (see, for example, Pelipas 2002, Yang 2001, and Sriram 1999b). The simple ECM is a transformed dynamic model and it can be expressed as follows:

$$\Delta\left(\frac{M}{P}\right) = \gamma_0 + \gamma_1 \Delta\pi_t^e + \gamma_2 \Delta \ln y_t - (1-\alpha_1)\left[\frac{M_{t-1}}{P_{t-1}} - \hat{\beta}_0 - \hat{\beta}_1 \pi_{t-1}^e - \hat{\beta}_2 y_{t-1}\right] + \varepsilon_t \qquad (7.16)$$

where $\gamma_1, \ldots \gamma_4$ - are the short- run parameters to measure the immediate impact effects. $(1-\alpha_1)$ is a speed of adjustment parameter, and it is equal to 0 when the adjustment is instantaneous, or in other words when the equilibrium holds. $\hat{\beta}_1, \ldots, \hat{\beta}_4$ are long-run parameters to measure the long-run impact. All the series are assumed to be cointegrated.

In recent empirical studies Johansen's full information maximum likelihood approach to estimating ECM (1988) of money demand function has taken centre stage. Johansen's procedure envisages testing for cointegrating relations in the context of vector error-correction model (VECM). The concept of cointegration implies the existence of long-term relationships between series. In turn, it requires a series to be integrated of the same order of integration and to be first-difference stationary (or integrated of order 1, I(1)) if it is non-stationary in levels.

Running a little bit ahead, we need to point out that our money demand model for Belarus contains I(0) variables. If we allow for a structural breaks in the series or if we still leave some doubt about the power of the test for a structural break, our money demand model contains a mixture of I(0) and I(1) variables (see section 7.4). This makes it difficult to apply Johansen's procedure. Instead we can use either PAM described above, or ARDL approach to cointegration (Pesaran et al. 2001) discussed in chapter 6 (pp.136-37). For robust results we will use the two-fold approach to estimating our money demand function, namely a Partial Adjustment Model (PAM) and an Autoregressive Distributed Lag (ARDL) approach to cointegration (see section 7.4).

Explanatory variables

Next we need to discuss which variables determine the level of real cash balances in Belarus. As outlined above, conventionally money demand can be defined as a function of real income, capturing the transaction motive to hold money; and the opportunity cost, as a rule represented by the nominal interest rate.

Because interests rates are not market determined and are subject to regulation by the monetary authorities in some transition economies, they cannot serve as a good proxy for the opportunity costs of holding money. This is especially typical of countries with high inflation rates and negative interest rates (e.g. Belarus). In these terms it makes sense to include the inflation rate as a supplement of the interest rate to measure the opportunity cost for holding money. Moreover, use of inflationary expectations to represent the opportunity cost of holding precautionary cash balances is needed to explain the relation between inflation and real cash balances within the adapted framework for estimating optimal seigniorage. Recalling Cagan's study of hyperinflation, in a period of high inflation, changes in demand for real balances largely result from the extreme fluctuation in prices. Finally, the expected rate of inflation as a proxy for opportunity costs has been used in many studies of money demand in countries with high inflation (see for example, Feltenstein and Ha 1991, Choudhry 1995, Yartseva 1999 etc.).

As far as the real income variable is concerned, Cagan (1956) does not include it in his model of real cash balances, arguing that it remained relatively stable during the period of hyperinflation. Moreover, Kiguel and Neumeyer (1995), while investigating the relationship between seigniorage and inflation in Argentina in the periods 1979-80,

1982-84, and 1986-1987, found that the coefficient on the transactions variable, represented by GDP, was not significantly different from zero. Other economists include income in the demand function, imposing a unitary income elasticity restriction. Some empirical studies show that this restriction does not hold (see for example Filosa 1995). In the present study we included real income as an explanatory variable, proxying it by monthly GDP.

The problems of empirical modeling of the money demand function in transition economies include the phenomenon of currency substitution for foreign currency and for quasi-money. The latter can be ignored for the time being since in the present study nominal money balances are proxied by high-powered money. As far as the problem of dollarization is concerned it can be captured by including the expected rate of devaluation of the national currency as an opportunity cost of holding money. However, using both the expected rate of inflation and the expected rate of currency devaluation in our model can result in problems of multicollinearity.[9]

Thus, the present model of money demand will include a real income, proxied by monthly GDP, and the expected rate inflation, to be discussed later.

Sources of dynamic behaviour

Cagan in his work on the monetary dynamics of hyperinflation argues that there is need to account for lags to explain the impact of the rate of change in prices on the demand for real money balances. On the one hand, it is a lag between the expected and the actual change in prices. On the other, he puts forward that adjustment of the real money balances towards the desired ones is not instantaneous.

Cagan finds that a lag in inflation expectations appears to be unusually long. At the same time he assumes that a lag in their impact on real cash balances is negligible. However, the impact of each of them could not be empirically distinguished that might imply that the greater length of the lag in expectations can be explained by the effect of the lag in real balances adjustment. He also finds that both an equation accounting for

[9] In fact, hypothesising the prevalence of rational expectations in the formation of the rate of devaluation of the national currency and the inflation rate, we pre-estimated model (7.18) by using the Generalised Instrumental Variable Method to account for a problem of measurement errors. Twice lagged values of the devaluation rate and inflation rate were used as instrumental variables. The results were unsatisfactory, with none of the explanatory variables, except for the once lagged value of the real cash balances, being statistically significant in explaining the money demand. The estimated coefficient of the rate of devaluation was equal to -.003 with a standard error equal to .006.

the lag in inflation expectations and an equation capturing the dynamics in real cash balances are identical, and thus imply the same relation between prices and money. Cagan also incorporated both lags together in the model, arguing that an equation with both lags would probably fit the data better. However, he did not estimate this equation, finding it difficult because the inclusion of the lagged dependent variable $m_{t-1} - p_{t-1}$ in the regression could make the estimates inconsistent due to the problem of serial correlation in the residuals. So, in his money demand function, relating actual real money balances to an exponentially weighted average of past rates of price change (see equation (7.4) in section 7.2), Cagan assumes that actual and desired real money balances are equal, and that variations in the expected rate of change in prices account for variations in real cash balances during hyperinflation.

In the present work to capture both dynamic processes in series we aim to estimate the following equation with application to PAM:

$$\ln\left(\frac{M}{P}\right)_t = \lambda\beta_1 + \lambda\beta_2 t + \lambda\beta_3\pi_t^e + \lambda\beta_4 \ln y_t + (1-\lambda)\ln\left(\frac{M}{P}\right)_{t-1} + \lambda u_t \qquad (7.17)$$

$$\pi_t^e = \gamma\pi_t + \gamma(1-\gamma)\pi_{t-1} + \gamma(1-\gamma)^2\pi_{t-2} + \ldots, \qquad (7.18)$$

where

M- nominal monetary base (MB)

P - price level measured by CPI

$\ln\left(\frac{M}{P}\right)_t$ - natural logarithm of real money balances at time t

π^e - is the expected inflation at time t.

By logging both sides of the equation, the coefficients take on the interpretation of elasticises (or semi-elasticity in case of inflation rate) or in other words the relative change in the dependent variable for a percentage change in explanatory variables.

Coefficient $\lambda\beta_i$ shows the short-run relationship effect of the explanatory variables on the dependant one. λ is the adjustment coefficient (see section 7.2). β_i

interpret long-run relationships. Theoretically, the coefficients will take the following signs: $\beta_2>0$, $\beta_3<0$, $\beta_4>0$.

Equation (7.18) is an adaptive expectations model of inflation, where π_t^e is a weighted average of the actual and past values of inflation. γ is the adjustment coefficient. The larger its value, the quicker the expected value of inflation adjusts to its previous actual outcomes. [10]

Deriving the revenue-maximizing money growth rate and maximum seigniorage with application to our money demand model

Assuming steady-state conditions, converting this money demand function from logs and substituting into the formula for seigniorage (7.1) yields:

$$S = g_t \frac{M_t}{P_t} = g_t \exp\left[\lambda\beta_1 + \lambda\beta_2 t + \lambda\beta_3\pi_t^e + \lambda\beta_4 \ln y + (1-\lambda)\ln\left(\frac{M}{P}\right)_{t-1} + \lambda u_t\right] \qquad (7.19)$$

The procedure for obtaining the maximum seigniorage is the same as described in section 7.2.

Assuming the steady-state conditions in the long run the full adjustment of real money balances to its equilibrium level will occur, that is:

$$\ln\left(\frac{M}{P}\right)_t = \ln\left(\frac{M}{P}\right)_{t-1} \qquad (7.20)$$

and money demand function will take the following form:

$$\ln\left(\frac{M}{P}\right)_t = \beta_1 + \beta_2 t + \beta_3\pi_t + \beta_4 \ln y_t + u_t \qquad (7.21)$$

Under steady-state condition the expected inflation rate is equal to the actual inflation rate, and equal to the rate of money growth. That is:

$$\pi^e = \pi_t = g_t \qquad (7.22)$$

[10] To derive the adaptive expectations model see for example Dougherty (2002). For more details of techniques used to estimate it see section 7.4.2.

To calculate the revenue-maximizing money growth rate we have:

$$\frac{\partial S}{\partial g_t} = \frac{\partial}{\partial g_t}\left[g_t \exp\left(\frac{M}{P}\right)_t\right] = \exp\left(\frac{M}{P}\right)_t + g_t \exp\left(\frac{M}{P}\right)_t \frac{\partial\left(\frac{M}{P}\right)_t}{\partial g_t} =$$

$$= \exp\left(\frac{M}{P}\right)_t + g_t \exp\left(\frac{M}{P}\right)_t (\beta_3) = \exp\left(\frac{M}{P}\right)_t (1 + g_t \beta_3) = 0 \qquad (7.23)$$

$$g = -\frac{1}{\beta_3} \qquad (7.24)$$

The derived revenue-maximizing rate of growth is consistent with Cagan's findings, and in the next section I present the empirical results for Belarus.

7.4 Empirical Results

7.4.1 Exploring the Data

It is necessary to begin this section with a data description and a graphical examination. As outlined in the previous section the model includes the following variables:

- Monetary base as a measure for monetary aggregate
- Inflation rate as a proxy for opportunity cost
- GDP, capturing the transactions demand for the Belarusian rouble.

The data are represented on a monthly basis ranging from May 1995 and December 2002. The sample is chosen on the basis of 1) data availability, and 2) consistency with chapter 6.

The monetary base (MB) is regarded as high-powered money, and is the sum of currency in circulation and the sum of reserve accounts of commercial banks at the National Bank. The nominal monetary base is deflated by the Consumer Price Index (CPI) in order to create the real money balances, and the monthly inflation rate is the rate of change of the CPI. The nominal GDP is deflated by the GDP deflator to create real GDP.

Data on the nominal monetary base was obtained from the National Bank of Belarus[11], while data on the monthly rate of inflation and monthly GDP (see appendix F for checking the reliability of GDP data) were provided by the Research Centre of Institute of Privatisation and Management, Belarus[12].

The real money balances and the real GDP series are presented in logarithmic form. Figures 7.2, 7.3 and 7.4 show the inflation rate (DP) and the natural logs of real money balances (LNM) and real GDP (LNY) correspondingly from May 1995 to December 2002. There are 92 observations in total.

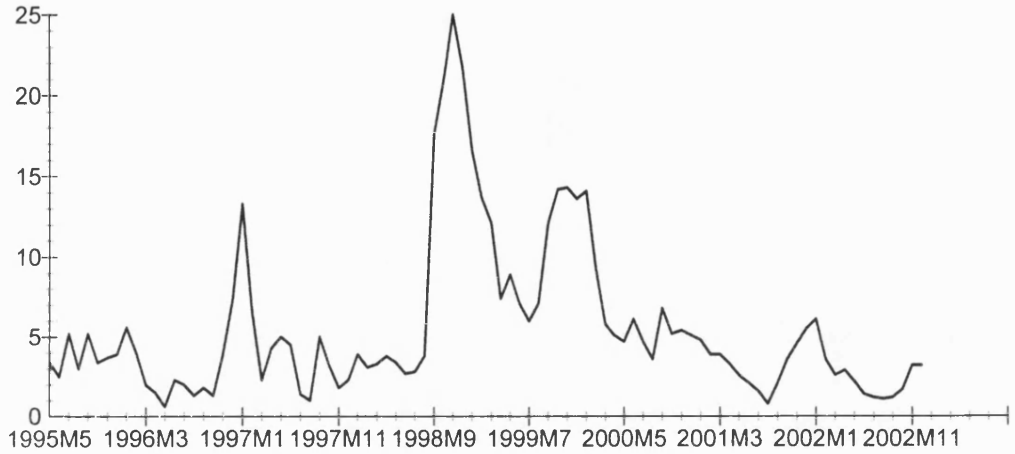

Figure 7.2: Inflation rate (DP)[13]

[11] National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003.
[12] Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003].
[13] Ibid.

Figure 7.3: The natural logarithm of real money balance (LNM)[14]

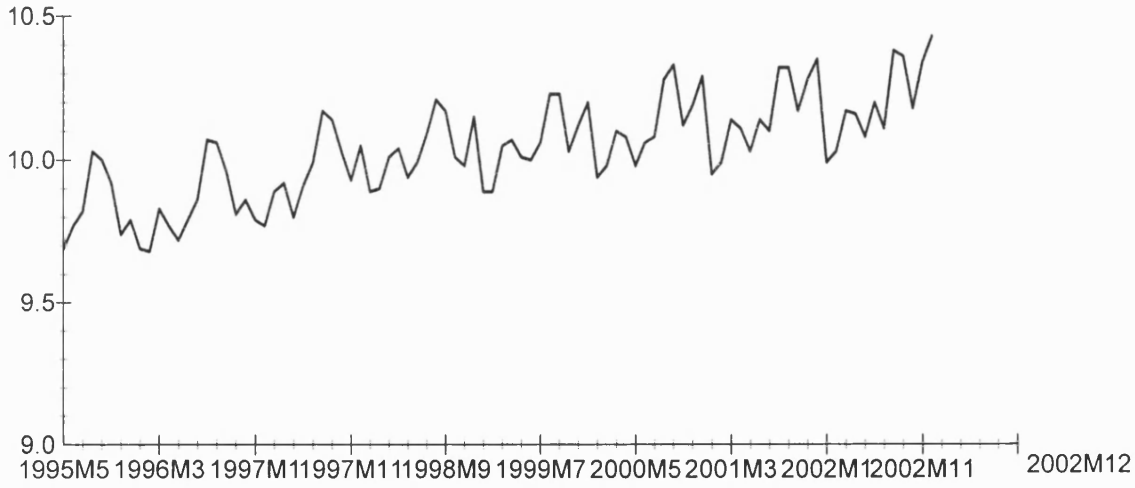

Figure 7.4: The natural logarithm of real GDP (LNY)[15]

While graphically examining GDP data, what first arrests our attention is that the log of real GDP (LNY) exhibits a seasonal pattern with the peaks in March and August-September that is closely linked with sowing and harvesting campaigns.

[14] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003).
[15] Authors' calculations on the data provided by the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003].

By testing all three series on seasonality, the results of the variable deletion test show that the introduced seasonal dummy variables are jointly significant only in the log of the real GDP series[16]. The real GDP series was seasonally adjusted using an X-11.2 procedure performed in EViews Version 3.1. All other estimations are conducted using either Microfit version 4.0 or EViews Version 3.1.

Figure 7.5 shows the seasonally adjusted log of real GDP.

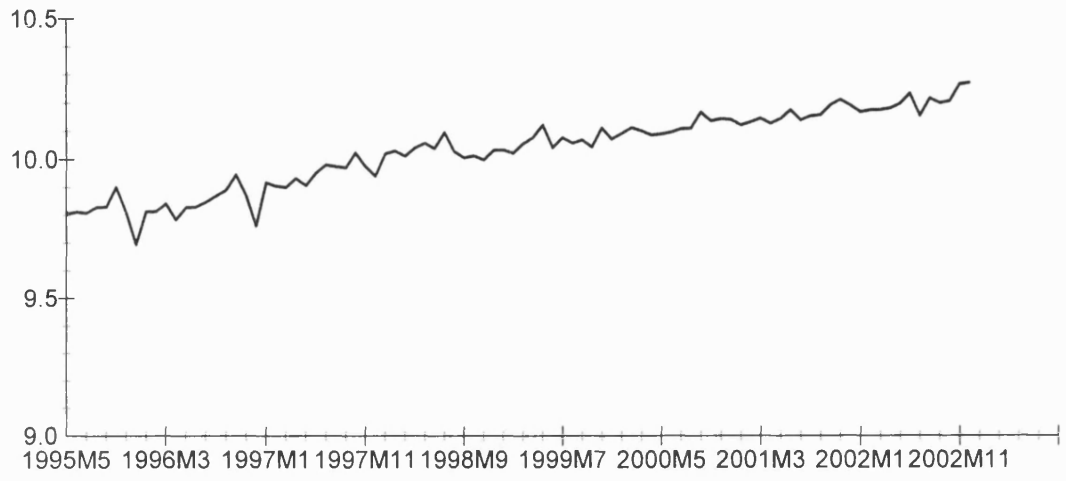

Figure 7.5: The natural logarithm of real GDP, seasonally adjusted[17]

7.4.2 Testing for a Unit Root in Series

To test our series for stationarity we begin through applying the Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) tests described in detail in section 6.4.1.[18]

Table 7.1 presents the summary of the ADF test for the presence of a unit root in levels or whether series is I(0) or I(1) stationary.

[16] F statistic (F (11, 80) is equal to 4.2985 with probability 0.000. This rejects the null hypothesis of joint insignificance of seasonal dummy at the 1% level of statistical significance.
[17] Authors' calculations on the data provided by the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003].
[18] See appendix E for the detailed description of the Dickey-Fuller and the Augmented Dickey-Fuller tests along with additional tests for the presence of a unit root in series.

Variable /Test statistic	τ_τ	$\tau_{\alpha\tau}$	$\tau_{\beta\tau}$	ϕ_3	ϕ_2	τ_μ	$\tau_{\alpha\mu}$	ϕ_1	τ
Model	Intercept & trend included in (7.26)					A linear trend excluded from (7.26)			Random walk
Hypothesis	$\gamma=0$	$\alpha_0=0$ given $\gamma=0$	$\alpha_1=0$ given $\gamma=0$	$\gamma=\alpha_1=$ $=0$	$\gamma=\alpha_1=$ $=\alpha_0=0$	$\gamma=0$	$\alpha_0=$ 0 given $\gamma=0$	$\alpha_0=$ $=\gamma=0$	$\gamma=0$
LNM (L=12)	-2.46	2.44	0.93	0.4	2.15	-2.38	2.38	3	0.2
LNYsa[19] (L=12th)	-5.51***	5.52***	5.19***	13.5***	10.1***	-1.61	1.62	1.4	0.9
DP (L=1)	-3.24*	1.87	-0.33	0.1	2.09	-3.26**	2.5*	3.1	-2**

Table 7.1: Results of ADF test for the presence of a unit root in level[20]

The results show that for the natural logarithm of GDP seasonally adjusted (LNYSA) and for the rate of inflation (DP) it is possible to reject the null hypothesis of a unit root at the 1 % and 5 % levels of significance correspondingly. It implies that these variables are stationary in levels. Moreover, for the LNYSA series the ADF regression contains both deterministic terms, namely an intercept and a linear trend, while for the DP series only an intercept is included in the regression. For DP series both the ϕ_2 and ϕ_1 statistics are not significant enough to reject the null hypotheses $\alpha_0=\alpha_2=\gamma=0$ and $\alpha_0=\gamma=0$. The value of $\tau_{\alpha\mu}$ allows rejecting the null hypothesis $\alpha_0=0$ at the 10 % level of significance. The results of the ADF test for the natural logarithm of money balances series (LNM) could not reject the null hypothesis of a unit root that implies that LNM is not stationary in levels. As a rule of thumb non-stationary series becomes stationary after taking its first differences.

Table 7.2 summarizes the results of the unit root test for LNM variable in first differences. The null hypothesis of a unit root can be rejected at the 1 % level of significance. Moreover, the estimated ADF regression for LNM series is regarded as a

[19] LNYsa is a seasonally adjusted natural logarithm of real GDP per capita; since only the AR at lag 12 is significant, there is no need to include all the AR terms up to 12 into the regression, but only the 12th lagged differences.

[20] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. *** = reject the null hypothesis at the 1 % level; ** = reject the null hypothesis at the 5 % level; * = reject the null hypothesis at the 10 % level. L in parentheses denotes a number of lagged differences. For the detailed description of the Dickey-Fuller and the Augmented Dickey-Fuller tests and for the interpretation of the labels denoting tau-statistics see appendix E.

random walk model, because neither an intercept nor a linear trend are statistically significant.

Variables /Test statistic	τ_τ	$\tau_{\alpha\tau}$	$\tau_{\beta\tau}$	ϕ_3	ϕ_2	τ_μ	$\tau_{\alpha\mu}$	ϕ_1	τ
Model	Intercept & trend included in (7.27)					A linear trend excluded from (7.27)			Random walk
Hypothesis	$\gamma = 0$	$\alpha_0 =$ 0 given $\gamma = 0$	$\alpha_1 = 0$ given $\gamma = 0$	$\gamma = \alpha_1 =$ $=0$	$\gamma = \alpha_1 =$ $= \alpha_0 = 0$	$\gamma = 0$	$\alpha_0 =$ 0 given $\gamma = 0$	$\alpha_0 =$ $= \gamma = 0$	$\gamma = 0$
LNM (L=12th)[21]	-6.98***	0.06	0.15	0.01	0.1	-7.04***	0.52	0.14	-7.06***

Table 7.2: Results of ADF test for the presence of a unit root in first differences[22]

Diagnostic tests (see table 7.3) performed to see whether the residuals are white noise, generally look good, apart from the test for normality in the DP series. One can see that there is a serious problem of normality in the series, suggesting a structural change in the data. Therefore, the above conclusion of the absence of a unit root in series can be biased. In this case we should test for a unit root in the presence of a structural change. Moreover, although the results of the test for normality of LNM series with estimation of the ADF regression both in levels and in first differences show that the residuals are normally distributed, a graphic examination of the data clearly point at the presence of a structural break somewhere in August 1998. Recalling the results of the ADF test of LNM series in first differences, one should note that the ADF regression exhibits a random walk. However, a graphic examination of the data shows that LNM is trended. Thus, the conclusion made earlier that LNM is I(1), might be premature. This offers an impetus along with DP series to test also LNM series for a unit root allowing for a structural change.

[21] Since only the AR at lag 12 is significant, there is no need to include all the AR terms up to lag 12 into the regression, but only the 12th lagged differences.

[22] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. *** = reject the null hypothesis at the 1 % level; ** = reject the null hypothesis at the 5 % level; * = reject the null hypothesis at the 10 % level. L in parentheses denotes a number of lagged differences. For the detailed description of the Dickey-Fuller and the Augmented Dickey-Fuller tests and for the interpretation of the labels denoting tau-statistics see appendix E.

Variables /Diagnostic Tests χ^2 [Pr]	Serial Correlation	Normality	Heteroscedasticity
LNYSA (L=12th) I(0)	χ^2 (12)=17.9113[.118]	χ^2 (2)= 1.1197[.571]	χ^2 (1)= .24106[.623]
LNM (L=12th) I(1)	χ^2 (12)= 12.3604[.417]	χ^2 (2)= 5.3947[.067]	χ^2 (1)= 1.3244[.250]
DP (L=1) I(0)	χ^2 (12)= 14.7212[.257]	χ^2 (2)= 408.2107[.000]	χ^2 (1)= .048296[.826]

Table 7.3: Summary of diagnostic tests[23]

Examining the inflation rate series graphically, we can observe two sharp changes in their level, occurring in December 1996 and September 1998. A sharp surge in inflation in September 1998 can be explained by the impact of the financial crisis in Russia in August 1998. It is more difficult to explain the rationale behind a surge in inflation at the end of 1996. It is likely to be caused by the accelerated monetary emission that fuelled inflation and could not be restrained despite existing price controls. Moreover, a relatively significant devaluation of the Belarusian rouble (evaluated at market exchange rates) at the end of 1996 and the beginning of 1997 led to increased import prices which in other words was inflation due to the increase in the enterprises' expenses.

Treating August 1998 as a break point, we can perform a unit root test with the presence of a structural change, using Perron's methodology (1989), and Banerjee's et al (1992) and Zivot and Andrews' (1992) methodologies with unknown timing of the break.[24]

Following the graphic examination of the data around the provisional structural break in August 1998 one can observe a one-time change in the level of the data. Therefore, to test for a unit root with the presence of structural break we use Perron's 'crash' model (7.25) (see appendix E). The null hypothesis is the presence of a unit root

[23] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. A number of lagged differences L is in parentheses; p-values are given in square brackets; I(x) indicates the level of stationarity.

[24] For the detailed description of these tests see appendix E.

in the series. Under the alternative hypothesis of stationary series, (7.25) allows a one-time change in the intercept of the function.

$$y_t = \alpha_0 + \alpha_1 t + \alpha_2 y_{t-1} + \alpha_3 DU_t + \alpha_4 D(TB)_t + \sum_{i=1}^{k} \alpha_5 \Delta y_{t-i} + u_t, \quad (7.25)$$

where DU_t is a dummy variable that assigns a level change; DU_t=1 if t> T_B, 0 otherwise.

$D(TB)_t$ is a pulse dummy variable that characterise the null hypothesis of a unit root; $D(TB)_t$=1 if t= T_B+1, 0 otherwise

Here, T_B is a break point that is August 1998 in the present case.

Under the null hypothesis α_2=1, α_1=0, α_3=0, while under the alternative one α_2<1, $\alpha_3 \neq 0$, and α_4 should be close to 0.

The lag-length is determined in the same way as in the ADF test - that is by providing the residuals are white noise[25].

The results of Perron's test for the inflation rate series are summarised in table 7.4.

Series	Time of break T_b	Number of lags	α_2	α_3	α_4	Diagnostic tests
DP	August 1998	5	0.629 (0.101)	3.93 (1.616)	10.79 (2.29)	SC: χ^2(12)=16.0219[.190] N: χ^2(2)= 5.3213[.070] H: χ^2(1)= 2.9617[.085]

Table 7.4: Perron's unit root test allowing for one structural change: inflation rate series[26]

The test statistic on α_2 =(0.629- 1)/0.101= - 3.67. The null hypothesis of the inflation series containing a unit root can be rejected at 5 % level (t-critical = - 3.46). Although

[25] In Perron's work (1989) a maximum value of lags (L) was set equal to 1 max that was regarded as an upper bound. L was chosen equal to l max if the last included lag was significant, namely the test statistic on α_5 was greater than 1.6. If not, the number of lags was reduced by one. Although this choice of the lag-length is consistent with model-selection criterions, AIC and SBC, in the present case, it does not provide residuals are white noise.

[26] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. α_2 is the coefficient of the once lagged inflation series; α_3 is the coefficient of the level dummy variable; α_4 is the coefficient of the pulse dummy variable. Standard errors are in parentheses. SC means serial correlation, N – normality, H – heteroscedasticity.

we can reject the null hypothesis of a unit root, the robustness of these results can be questioned. Under the alternative hypothesis of no unit root the coefficient of pulse dummy variable (*D(TB)*) should be close to zero, while the coefficient of the level dummy variable (*DU*) should be significantly different from 0. In the present case a coefficient of pulse dummy variable (*D(TB)*) is significantly different from 0. Moreover, the value of t statistic is not significantly different from its critical value. The results of Perron's test can be also biased because of the assumption of the date of break to be known a priori. However, the break might have occurred not in August 1998 but in September or October 1998, if there was a lag in response to the crisis in Russia. In this case there is need to use a more sophisticated test for the presence of a unit root allowing for a structural break of unknown timing, or in other words assuming that the date of the break is unknown a priori. Thus we use a recursive, rolling and sequential approach (Banerjee et. al. 1992).

To perform the Banerjee et al. test we estimate regression (7.26) and compute the set of ADF t statistics (see appendix E).

$$\Delta y_t = \alpha_0 + \alpha_1 t + \alpha_2 y_{t-1} + \sum_i^k \alpha_3 \Delta y_{t-i} + u_t \qquad (7.26)$$

The lag-length, L=4, is determined on the basis of model-selection criteria and providing the residuals are white noise. The summary of the tests is presented in table 7.5.

Test statistics	Recursive min t st.	Rolling min t st.	Mean-shift Statistics[27]		Trend-shift Statistics[28]	
			min t st.	max F	min t st.	max F
Statistics' values	-3.34	-7.96***	-5.57***	15.65	-4.39*	9.63
Estimated time of break	1995:5-2000:6	1998:9-2001:3	1998:8	1998:8	1999:5	1999:5
Diagnostic tests	Serial Correlation: χ^2 (12)= 9.4[.67] Normality: χ^2 (2)= 95.5[.00] Heterosced..: χ^2 (1)=.031[.86]	Serial Correlation χ^2 (12)= 5.9[.2] Normality: χ^2 (2)= .63[.44] Heterosced.: χ^2 (1)= .05[.83]	Serial Correlation χ^2 (12)= 9.311[.00] Normality: χ^2 (2)= 48.894[.00] Heterosced.: χ^2 (1)= 3.289[.000]		Serial Correlation χ^2 (12)= 13.717[.319] Normality: χ^2 (2)= .2553[.613] Heterosced.: χ^2 (1)= 1.3925[.238]	

Table 7.5: Recursive rolling and sequential tests for the presence of a unit root: inflation rate series.[29]

The results do not provide much clarity about the possible structural changes in inflation rate data and generally look rather conflicting. For example, the estimated t min rolling statistic shows that a structural change has likely occurred between September 1998 and March 2001. The minimum mean-shift t statistic is significant enough to reject the hypothesis of a unit root, and points to the break occurring in August 1998, although the F max statistic is not significant enough to support this conclusion.

Rethinking the graph analysis of inflation series again, one can observe the possible shift in trend occurred somewhere at the end of 1999. The minimum trend-shift t statistic points to a possible break occurring in May 1999. It is significant at 10 % level of significance to reject the null hypothesis of a unit root allowing for a change in trend. However, the F max statistic is not statistically significant enough to support this result. Moreover, diagnostic tests, particularly a normality test, still pinpoint the problem of normality, questioning the robustness of the results when mean-shift statistic is used.

[27] Regression (7.26) was estimated; D=1 for (t>k), 0 otherwise.
[28] Regression (7.26) was estimated; D=t-k for (t>k), 0 otherwise.
[29] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]; *** = reject the null hypothesis at the 1 % level; ** = reject the null hypothesis at the 5 % level; * = reject the null hypothesis at the 10 % level.

The results of the Zivot-Andrews test, performed in WinRATS-32 version 5.04, suggest a clear break in intercept/or intercept and trend occurring in September 1998. The minimum t statistics are equal to –4.91 (break in intercept) and –6.69 (break in both intercept and trend) that allow to reject the null hypothesis of a unit root in the inflation rate series at the 5 and 1 % levels respectively.[30]

Summarizing the aforesaid, one can conclude that there is only one clear break in the inflation series, occurring around the date of the financial crisis in Russia (August-September 1998). Thus, further analysis will be undertaken accounting for this break.

We also test money demand series for stationarity allowing for a structural break. For this we estimate (7.25). Table 7.6 summarises the results of Perron's (1989) test for unit root with the presence of one structural change in series.

Series	**Time of break T_b**	**Number of lags, l**	α_2	α_3	α_4	**Diagnostic tests**
Money Demand (LNM)	August 1998	12	0.7532 (.0564)	-0.224 (-.047)	0.115 (0.083)	SC: χ^2 (12)=15.56[.212] N: χ^2 (2)= 0.961[.953] H: χ^2 (1)= .055[.815]

Table 7.6: Perron's unit root test allowing for one structural change: real cash balances series[31]

The test statistic on α_2 = (0.7532- 1)/0.0564= - 4.38. The null hypothesis of the money demand series containing a unit root can be rejected at the 1 % level of significance (t-critical = - 4.34). This implies that the money demand series is trend-stationary with a shift in mean. The results of the Zivot-Andrews test confirm that real cash balances series is I(0) if we allow for a structural change in both intercept and trend in the aftermath of the financial crisis in Russia (October 1998).[32]

[30] For Zivot and Andrews' critical values see table 6.4 in chapter 6. For the detailed description of the test see appendix E.

[31] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Regression (7.25) was estimated. α_2 is the coefficient of the once lagged real cash balances; α_3 is the coefficient of the level dummy variable; α_4 is the coefficient of the pulse dummy variable. Standard errors are in parentheses. SC means serial correlation, N – normality, H – heteroscedasticity.

[32] The minimum t-statistics estimated at –5.56 (allowing for a break in intercept) and –5.16 (allowing for a break in both intercept and trend) allow to reject the H0 of a unit root at the 1 and 5 % levels

7.4.3 Estimating the Final Regression

For robust results it is reasonable to use the two-fold approach to estimating our final regression. Assuming all series is I(0)[33], the first approach is to estimate a Partial Adjustment Model (PAM), while the second one is an Autoregressive Distributed Lag (ARDL) approach to cointegration, which does not require us to know whether the variables are integrated of order I(1) or I(0).

7.4.3.1 Partial Adjustment Model under the Hypothesis of Adaptive Expectations Formation

To capture both dynamic processes in series, namely the lag in inflation expectations and a gradual adjustment of the actual to desired real money balances (see section 7.3), we use a Partial Adjustment Model (7.27) with an adaptive expectations model of inflation (7.28) nested into it.

$$\ln\left(\frac{M}{P}\right)_t = \lambda\beta_1 + \lambda\beta_2\pi_t^e + \lambda\beta_3 \ln y_t + (1-\lambda)\ln\left(\frac{M}{P}\right)_{t-1} + \lambda\beta_4 DU + \lambda u_t \qquad (7.27)$$

$$\pi_t^e = \gamma\pi_t + \gamma(1-\gamma)\pi_{t-1} + \gamma(1-\gamma)^2\pi_{t-2} + \ldots, \qquad (7.28)$$

where M- nominal monetary base (MB)

P - price level measured by CPI

$\mathrm{Ln}\left(\frac{M}{P}\right)_t$ - natural logarithm of real money balances at time t

Ln y – natural logarithm of real GDP, seasonally adjusted

π^e is the expected inflation at time t.

DU is an impulse dummy variable capturing the impact of the Russian financial crisis. DU =1 if Tb= August 1998 – April 1999 and 0 otherwise. As it was suggested by the results of various tests for structural break and as it can be observed graphically, August 1998 – April 1999 are regarded as the most turbulent months for real balances.

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respectively.

[33] This assumption can be supported by the results of a unit root test with the presence of structural breaks in the series (see section 7.4.2).

To estimate equation (7.27), we should use different techniques for the robustness of our results.

First we use a grid search to find the appropriate γ that lies between 0 and 1. For this we construct ten values of π_t^e using the following values of γ: 0.1,0.2...1.0 for different number of lags, and fitting (7.27) with each of the computed in this way π_t^e. The maximum number of lags used is five. As the number of lags increases the weights $(1-\gamma)^n$, with n equal to the number of lags, geometrically decline and become statistically insignificant. The choice of the parsimonious result is based on obtaining the lowest residual sum of squares in regression (7.27). At the same time there is also the need to pay attention to model-selection criteria, namely the Akaike information criterion (AIC) or the Schwarz Bayesian Criterion (SBC), and to make sure that the residuals are white noise, while comparing the final results. Table 7.7 presents the summary of the most parsimonious results.

γ	**Lags order of π_t**	α_1	α_2	α_3	α_4	**AIC**	**SBC**	**Adj. R Sq.**	**RSS**
0.9	3	-.0089 (.0022) P-value [0.000]	0.3E-3 (.0365) P-value [.993]	.0767 (.0625) P-value [0.223]	.8853 (.0411) P-value [0.000]	104.1	97.88	.8875	.4488

Table 7.7: Summary of the results of estimating the PAM with a grid search method used to derive the expected rate of inflation[34]

As one can see the model selection criteria are higher for the model with the maximum length of the lagged values of inflation rates in (7.28) equal to three. However, the model does not pass the conventional test for autocorrelation of residuals that bias the

[34] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Standard errors are in parentheses. *Model estimated:*

$\alpha_0 + \alpha_1 \pi_t^e + \alpha_2 DU + \alpha_3 LNY + \alpha_4 LNM(-1)$ (7.29). Initially regression (7.29) was estimated with the presence of a linear trend. Due to its statistical insignificance, it was later omitted from regression (7.29). To save some space p-values are used here and thereafter instead of asterisks to denote statistical significance of the coefficients.

results[35]. But the Newey-West adjustment of standard errors allows us to obtain consistent autocorrelation estimates (see table 7.8).

α_1	α_2	α_3	α_4
-.0089 (.0026)	0.3E-3 (.041)	.0767 (.05217)	.8853 (.0412)
P-value [0.001]	P-value [.994]	P-value [0.145]	P-value [0.000]

Table 7.8: Summary of the results of estimating regression (7.29) based on Newey-West adjusted S.E.'s Barlett weights, truncation lag=12[36]

One can see from Table 7.8 that a dummy variable[37] and intercept are statistically insignificant. Re-estimation of model (7.29) without these two variables gives the results presented in table 7.9.

α_1	α_3	α_4
-0.0088 (0.001)	0.1058 (0.0338)	.8952 (0.0363)
P-value [0.000]	P-value [0.002]	P-value [0.000]

Table 7.9: Summary of the results of estimating model (7.29) with the estimates adjusted for autocorrelation[38]

[35] Diagnostics: serial correlation: χ^2 (12)= 26.83[.008]; functional form: χ^2 (1)= .1181[.731]; normality: χ^2 (1)= 3.0268[.22]; heteroscedasticity: χ^2 (1)= .4072[.523].

[36] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Standard errors are in parentheses. *Model estimated:*

$\alpha_0 + \alpha_1 \pi_t^e + \alpha_2 DU + \alpha_3 LNY + \alpha_4 LNM(-1)$ (7.29). The choice of the lag-length equal to 12 is explained by the fact that we have monthly data.

[37] Although a few researches have been undertaken on the Belarusian money demand function since transition began, most of them either do not take into consideration a dummy variable that captures an impact of the financial turmoil in Russia in August 1998 (see Boichanka 2000, Yartseva 1999) or show results that are in line with ours, implying statistical insignificance for this dummy variable (see Pelipas 2002).

[38] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Standard errors are in parentheses.

Though the method of grid search is widely used in estimating non-linear regressions, it can be criticised from the following point of view. While constructing π_t^e values with γ ranging from 0.1 to 1 with the use of Excel, we get the computed values of π_t^e that potentially deviate from $\hat{\pi}_t^e$ by disturbance term. In turn it can bias the obtained coefficients in the final model. That is why we should use another technique to estimate regression (7.28). It is the iterative linearization method. Microfit and Eviews allow estimating non-linear regression by using this technique. Basically, it involves linearization of a non-linear equation around some initial set of parameters. Then, OLS is performed on this linear equation, and a new set of parameters is generated. Non-linear equations are linearized around this new set of parameters. The process is repeated until convergence is achieved. Table 7.10 presents the summary of the most parsimonious results.

α_1	α_2	α_3	α_4	α_5	**AIC**	**SBC**	**Adj. R sq.**
-0.0089 (.0026)	.90620 (0.407)	.1E-3 (.038)	0.077 (.065)	.88575 (.05)	103.10	95.64	.88750
P-value [0.001]	P-value [.029]	P-value [.998]	P-value [.243]	P-value [.000]			

Table 7.10: Summary of the results of estimating non-linear regression (7.30) by the iterative linearization method[39]

Although the model selection criteria chose the model with three lagged values of the inflation rate, the specified model does not pass the conventional test for serial correlation. To overcome this problem requires the Newey-West procedure to adjust estimates for serial correlation. Table 7.11 presents the results of non-linear estimation based on Newey-West adjusted S.E.'s Bartlett weights.

[39] Model estimated: $\alpha_0+\alpha_1(\alpha_2\pi_t+\alpha_2(1-\alpha_2)\pi_{t-1}+\alpha_2(1-\alpha_2)^2\pi_{t-2}+...+\alpha_2(1-\alpha_2)^n\pi_{t-n})$ $+\alpha_3$DU$+\alpha_4$LNY$+\alpha_5$LNM(-1) (7.30). Initially regression (7.30) was estimated with the presence of a linear trend. Due it its statistical insignificance, it was omitted from regression (7.30) later on. Coefficients α_1, α_3, α_4 and α_5 are correspondingly equal to $\lambda\beta_2$, $\lambda\beta_4$, $\lambda\beta_3$ and $(1-\lambda)$ of regression (7.27). Diagnostics: serial correlation: $\chi^2(12)$= 26.87[.008]; functional form: $\chi^2(1)$= .1175[.732]; normality: $\chi^2(1)$= 3.0240[.22]; heteroscedasticity: $\chi^2(1)$= .4092[.522].

α_1	α_2	α_3	α_4	α_5
-.0089	.90620	.1031E-3	.077	.88575
(.00256)	(0.1741)	(.040292)	(.053260)	(.049810)
P-value	P-value	P-value	P-value	P-value
[0.001]	[.000]	[.998]	[.155]	[0.000]

Table 7.11: Summary of the results of estimating model (7.30) based on Newey-West adjusted S.E.'s Bartlett weights, truncation lag= 12[40]

As in a grid search technique a dummy variable and intercept are statistically insignificant, so we re-estimate model (7.30) omitting these two variables. The results are presented in Table 7.12.

α_1	α_2	α_4	α_5
-.0087	.96244	.10277	.89543
(.972E-3)	(.23381)	(.035617)	(.03825)
P-value	P-value	P-value	P-value
[.000]	[.000]	[.005]	[.000]

Table 7.12: Summary of the results of estimating model (7.30) with the estimates adjusted for autocorrelation using Newey-West adjusted S.E.'s Bartlett weights [41]

The above results are consistent with those obtained by using a grid search methodology. All the coefficients have the expected signs and are statistically significant. One can notice that the coefficient of inflation expectations is close to one. In this regard it is also reasonable to test a hypothesis of rational expectations formation for the robustness of our results.

[40] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Standard errors are in parentheses.

[41] Ibid.

7.4.3.2 Partial Adjustment Model under the Hypothesis of Rational Expectations Formation

When hypothesising rational expectations, we assume that on average the rational expected rate of inflation is equal to the actual rate. It follows from the interpretation of the conditional expected function, which implies that the forecast error has a zero mean and it is uncorrelated with all the components of the information set (see Patterson 2000, p. 533). Therefore, defining ${}_{t-1}\pi^{e}{}_{t} = \mathrm{E}_{t}\{\pi_{t} | \Omega_{t-1}\}$ as the expectation of inflation formed at t-1 to prevail at t, where Ω_{t-1} is the information available at the moment of expectation formation, it follows (see Patterson 2000, p.534):

$$\pi_{t} = \mathrm{E}_{t}\{\pi_{t} | \Omega_{t-1}\} + \mathrm{e}_{t} = {}_{t-1}\pi^{e}{}_{t} + \mathrm{e}_{t} \tag{7.31}$$

$${}_{t-1}\pi^{e}{}_{t} = \pi_{t} - \mathrm{e}_{t} \tag{7.32}$$

By substituting (7.32) into (7.27) we obtain equation (7.33):

$$\ln\left(\frac{M}{P}\right)_{t} = \lambda\beta_{1} + \lambda\beta_{2}\pi_{t} + \lambda\beta_{3}\ln y + (1-\lambda)\ln\left(\frac{M}{P}\right)_{t-1} + \mu_{t}, \tag{7.33}$$

where is $\mu_{t} = \lambda u_{t} - \lambda\beta_{2}e_{t}$

This equation has potential measurement errors, that could render the inflation estimator inconsistent, because π_{t} is correlated with a deterministic term and it is determined endogenously. To overcome this problem requires the Generalised Instrumental Variable Method, or in other words the Two-Stage Least Squares Method (TSLS) that requires π_{t} to be regressed on a set of instruments that are closely correlated with the expected rate of inflation, but uncorrelated with an error term, μ_{t}. Since it is unrealistic to have all the variables that compose Ω_{t-1}, known a priori, it is reasonable to adopt a 'partly rational expectations' concept due to Sargent (1973) and McCallum (1976). This means that we can use just the lagged values of the inflation rate as the information set. Moreover, since the use of TSLS method requires the number of instruments to be at least equal to the number of regressors, any other right-hand side predetermined (exogenous) variables can be used as instruments as well. Thus, we estimate equation (7.33) by using TSLS technique, where intercept, dummy variable (DU), real income (LNY), once lagged value of the real cash balances

(LNM_{t-1}), and twice lagged values of the inflation rate are used as instrumental variables (π_{t-1}, π_{t-2}). The results of the estimated regression are presented in table 7.13.

α_1	α_2	α_3	α_4	α_5	**GR-Bar-Sq.**	**Sargan's χ^2 (1) statistic**
.65709 (.6423)	-.00887 (.003)	.0472 (.064)	-.002 (.043)	.88514 (.043)	.8647	.84258
P-value [.309]	P-value [.004]	P-value [.462]	P-value [.958]	P-value [.000]		P-value [.359]

Table 7.13: Summary of the results of estimating PAM (7.33) under hypothesis of RE formation[42]

All the coefficients have the expected signs, including the dummy variable, although it is still statistically insignificant. Sargan's χ^2 statistic shows that the model is correctly specified and the instrumental variables are valid instruments. There is still a problem of the presence of serial correlation in the residuals that bias the results. The Newey-West procedure should be used to adjust estimates for serial correlation (see table 7.14 for the adjusted results).

[42] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Standard errors are in parentheses. *Model estimated:*

$$\ln\left(\frac{M}{P}\right)_t = \lambda\beta_1 + \lambda\beta_2\pi_t + \lambda\beta_3 \ln y + \lambda\beta_4 DU + (1-\lambda)\ln\left(\frac{M}{P}\right)_{t-1} + \mu_t \quad (7.33).$$

Initially regression (7.33) was estimated with the presence of a linear trend. Due to it its statistical insignificance, it was later omitted from regression (7.33). Coefficients α_1, $\alpha_2, \alpha_3, \alpha_4$ and α_5 are correspondingly equal to $\lambda\beta_1, \lambda\beta_2$, $\lambda\beta_3$, $\lambda\beta_4$ and $(1-\lambda)$ of regression (7.33). Diagnostics: serial correlation: $\chi^2(12)$= 21.82[.04]; functional form: $\chi^2(1)$= .15[.70]; normality: $\chi^2(1)$= 1.8[.41]; heteroscedasticity: $\chi^2(1)$= .017[.68].

α_1	α_2	α_3	α_4	α_5
.65709	-.00887	.0472	-.002	.88514
(.4137)	(.003)	(.0482)	(.043)	(.046)
P-value	P-value	P-value	P-value	P-value
[.116]	[.002]	[.330]	[.959]	[.000]

Table 7.14: Summary of the results of estimating PAM (7.33) under the hypothesis of RE formation with the estimates adjusted for autocorrelation using Newey-West adjusted S.E.'s Bartlett weights, truncation lag= 12[43]

After adjusting the standard errors for serial correlation one can notice that a dummy variable is still statistically insignificant. Re-estimation of equation (7.33) without a dummy variable, after adjusting for autocorrelation, improves the estimates, but the real income variable still appears to be statistically insignificant (table 7.15).

α_1	α_2	α_3	α_5
.66275	-.0090727	.047771	.88404
(.41102)	(.0011237)	(.046002)	(.040710)
P-value	P-value	P-value	P-value
[.111]	[.000]	[.302]	[.000]

Table 7.15: Summary of the results of estimating model (7.33) with a dummy variable omitted from the regression and with the estimates adjusted for autocorrelation using Newey-West adjusted S.E.'s Bartlett weights[44]

This suggests that in Belarus in 1995-2002 money demand was still mainly determined by the expected inflation rate. Indeed, because of the policy of excessive money emission over most of the analysed period, this fact is not surprising. Moreover, it is necessary to note that the adjustment in real cash balances is not instantaneous. The coefficient of adjustment is equal to 0.11596 (1-0.88404) suggesting that nearly 12 per cent of the discrepancy between actual and real cash balances is eliminated within one month, and the full adjustment is achieved within 8.6 months or in other words nearly 3 quarters. The long-run semi-elasticity coefficient of the money demand with respect to

[43] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Standard errors are in parentheses.

[44] Ibid.

the inflation rate is equal to -0.0782 meaning that on the average the real cash balances decreased by the rate of 7.8 per cent a month when the inflation rate increased by one per cent.

7.4.3.3 ARDL Approach to Cointegration

Another technique that is reasonable to apply to estimating equation (7.28) for checking the robustness of the final results before proceeding further, is an ARDL procedure or in other words the bounds testing approach to cointegration described in more details in section 6.4.2

At the first stage of the ARDL procedure we examine the existence of a long-run relationship in equation (7.27) where the expected rate of inflation is proxied by the actual rate of inflation. For this we estimate a conditional error correction model of money demand for the number of lags of the VAR model. The lag order of the money demand equation was chosen on the basis of the model selection criteria and providing residuals are white noise. Tables 7.16 and 7.17 present the corresponding statistics for selecting the lag order of the money demand equation and the results of the bounds test. Model selection criteria and LM statistics choose the lag order of money demand equation equal to 2.

	With a linear trend					Without a linear trend				
p	AIC	SBC	χ^2 sc(1)	χ^2 sc(4)	χ^2 sc(12)	AIC	SBC	χ^2 sc(1)	χ^2 sc(4)	χ^2 sc(12)
1	102.93	91.68	12.8207 [.000]	16.5565 [.002]	33.1215 [.001]	103.32	93.32	9.6025 [.002]	13.2864 [.010]	25.7240 [.012]
2	**106.64**	**91.71**	**.095942 [.757]**	**1.9237 [.750]**	**17.0808 [.147]**	**105.61**	**91.92**	**.11860 [.731]**	**2.4388 [.656]**	**17.4171 [.135]**
3	102.93	84.35	.54908 [.459]	6.9694 [.138]	18.5697 [.099]	103.19	85.85	.090803 [.763]	6.0479 [.196]	16.7931 [.158]
4	102.40	80.21	.51732 [.472]	3.2429 [.518]	21.4331 [.044]	101.95	80.99	.14387 [.704]	5.6766 [.225]	20.9948 [.050]

Table 7.16 Statistics for selecting the lag order of money demand equation[45]

[45] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. P-values are in square brackets. *Model estimated*: $\Delta \ln m_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{n} \alpha_2 \Delta \ln m_{t-i} + \sum_{j=0}^{m} \alpha_3 \Delta \pi_{t-j} + \sum_{j=0}^{m} \alpha_4 \Delta \ln y_{t-j} + \alpha_5 DU + \delta_1 \ln m_{t-1} + \delta_2 \pi_{t-1} + \delta_3 \ln y_{t-1} + u_t$ (7.34); χ^2 sc(1), χ^2 sc(4), χ^2 sc(12) are LM statistics for testing no residual serial correlation against orders 1, 4 and 12 correspondingly. P-is the lag order of the VAR model for ECM (7.34)

p	With intercept and deterministic trend, F (LNM| π, LNY)	With intercept and no deterministic trend, F (LNM| π, LNY)
2	11.145***	9.887***

Table 7.17: Bounds test for testing the existence of long-run relationship in money demand function[46]

Since F(LNM\| π, LNY) exceeds the upper bound of the critical value band at the 1 % level of significance, it implies that the null hypothesis of non-existence of long-run relationship between LNM, π and LNY can be rejected.

The same procedure is applied to test the significance of π and LNY lagged level variables in the error correction model explaining $\Delta\pi_t$ and ΔLNY. If F statistics for testing the joint significance of the lagged level variables fall below the lower bound of the critical value band it implies that they do not enter significantly in the equations for $\Delta\pi_t$ and ΔLNY, and in other words can be treated as 'long-run forcing' variables.

The results of the bounds test are presented in tables 7.18 and 7.19 correspondingly.

p	With intercept and deterministic trend, F (π |LNM, LNY)	With intercept and no deterministic trend, F (π |LNM, LNY)
1	8.64***	8.59***

Table 7.18: Bounds test for testing the significance of π lagged level variable in the error correction model explaining $\Delta\pi_t$[47]

[46] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. *P* denotes a lag order. *** means that H0 is rejected at the 1 % level of significance. Critical value bounds of the F statistic with unrestricted intercept and trend at the 1% level of significance are: I(0) 6.34 and I(1) 7.52; and with unrestricted intercept and no trend correspondingly they are I(0) 5.15 and I(1) 6.36 (Pesaran et. al. 2001, pp. T.1-T.3).

[47] Ibid

p	With intercept and deterministic trend, F (LNY| π, LNM)	With intercept and no deterministic trend, F (LNY| π, LNM)
2	3.4656	.62540

Table 7.19: Bounds test for testing the significance of LNY lagged level variable in the error correction model explaining ΔLNY[48]

From the results presented in Table 7.19 one can see that the F statistic for testing the joint significance of the lagged level variables falls below the lower bound of the critical value band, suggesting that the income variable does not enter significantly into the equations for ΔLNY, and can be treated as a 'long-run forcing' variable for the explanation of money demand.

From Table 7.18 one can see that the F statistic far exceeds the upper bound of the critical value band at the 1 % level of significance, implying the problem of endogeneity of the inflation rate variable. In turn this suggests that there exists more than one cointegrating relationship in the money demand equation.

A further application of the ARDL procedure is inappropriate in estimating the money demand function, because the ARDL technique is based on estimating a single equation, while dealing with situations where there can be more than one level relationship, as in our case, is a matter of further research. Our assumption about the order of integration of the series, namely I(0) if we allow for a structural break in it, or a mixture of I(0) and I(1) if not, does not allow us to apply the Johansen cointegration procedure, requiring all the series to be I(1). That is why to proceed further with deriving the revenue-maximizing money growth rate we should use the estimates obtained from the PAM under the hypothesis of rational expectations formation. The rationale of using the results obtained from the PAM is based on the assumption that our series is likely to be treated as level stationary or in other words I(0) that is plausible if we allow for a structural break in the series.

[48] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. *P* denotes a lag order. *** means that H0 is rejected at the 1 % level of significance. Critical value bounds of the F statistic with unrestricted intercept and trend at the 10 % level of significance are: I(0) 4.19 and I(1) 5.06; and with unrestricted intercept and no trend correspondingly they are I(0) 3.17 and I(1) 4.14 (Pesaran et. al. 2001, pp. T.1-T.3).

7.4.3.4 Deriving the Revenue-maximizing Money Growth Rate on the Basis of the Obtained Estimates from PAM under the Hypothesis of Rational Expectations Formation

To recall our findings, during 1995-2002 on average real money balances in Belarus decreased by 7.8 per cent per month if the inflation rate grew by one per cent. This suggests that Belarus was on the downward part of the Laffer curve on the Laffer curve during the above period. Indeed, further investigation of this issue based on the results in table 7.20, supports our conclusion for 1995. However, this was not the case for 1998-2000 developments, when Belarus was positioned upwards on the Laffer curve, despite the fact that the inflation rate exceeded the nominal monetary growth rate during these periods, which presupposes Belarus's downwards position on the Laffer curve. This phenomenon therefore requires further investigations to obtain a full picture of the results.

The revenue-maximazing rate of money growth for Belarus from May 1995 – December 2002 on average was equal to 12.79 percent per month. This is derived from the formula $g= -\frac{1}{\beta_2}$, where β_2 is the coefficient of the inflation rate in (7.33). Table 7.20 shows the revenue-maximizing money growth rate for Belarus correspondingly as a percentage change per month, quarter and year.

Revenue-maximizing Money Growth Rate[49]		
as a percentage change per month	**as a percentage change per quarter**	**as a percentage change per year**
12.79	43.5	323.88

Table 7.20: Revenue-maximizing money growth rate for Belarus expressed as a percentage change per month, quarter and year[50]

[49] Taking into account that the monthly growth rate is equal to 12.79 per cent and the steady-state conditions held, the quarterly and the yearly revenue-maximizing growth rate are calculated correspondingly as ((1.1279)^3 – 1)*100 and ((1.1279)^12 – 1)*100.

[50] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003].

Years	Maximizing money growth rate, % change	Actual money growth rate, period average (end of period), % change	Actual inflation , period average, (end of period), % change	Actual real money growth rate, period average (end of period), % change	Maximum revenue from S, period average (end of period) as a % of GDP	Actual revenue from S, period average (end of period), as a % of GDP	Actual revenue from IT, period average (end of period), as a % of GDP
1995	323.88	473* (457.43)	566.57 (244.18)	-93.57 (213.25)	9.92	** (3.61)	** (2.47)
1996	323.88	126.01 (75.42)	52.66 (39.13)	73.35 (36.29)	9.65	2.9 (2.44)	1.21 (1.26)
1997	323.88	88.79 (96.41)	63.88 (63.42)	24.91 (32.99)	8.67	2.53 (3.00)	1.82 (1.97)
1998	323.88	100.21 (102.14)	73.2 (181.74)	27.01 (-79.6)	7.99	2.87 (2.04)	2.1 (3.63)
1999	323.88	172.59 (204.05)	293.8 (251.3)	-121.21 (-47.25)	7.73	2.43 (2.27)	4.13 (2.8)
2000	323.88	142.7 (125.23)	168.9 (107.97)	-26.2 (17.3)	7.31	1.92 (1.93)	2.27 (1.66)
2001	323.88	130.1 (120.02)	61.38 (46.35)	68.72 (73.67)	7.03	2.54 (2.73)	1.2 (1.06)
2002	323.88	59.01 (40.1)	42.76 (34.87)	16.25 (5.3)	6.71	1.77 (1.42)	1.28 (1.24)

Table 7.21: Maximum annual revenue from seigniorage and inflation tax and actual revenue from seigniorage and inflation tax compared[52]

[52] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. * Since the data on the total monetary base (inclusive both currency in circulation and bank reserves) are not available for 1994, here the data on currency in circulation are only taken to evaluate the actual monetary growth rate in 1995. **For 1995 the figures on the actual revenue from seigniorage and from inflation tax (period average) as a per cent of GDP are missing because of the lack of the data needed to compute them.

Second, in 1995 the actual rate of money growth exceeded the revenue-maximizing rate and a higher level of seigniorage was achieved at the expense of accelerating inflation (calculated as a period average). In this period the actual rate of inflation exceeded the revenue-maximizing rate (it is equal to the revenue-maximizing money growth rate meaning the steady-state conditions) by 75 per cent. An inflation rate above the nominal money growth rate decreased real cash balances.

However, a hypothesis that Belarus continued to be positioned on the downward side of the Laffer curve from the end of 1995 onwards does not seem to receive enough support. The end-of-period actual inflation rate in 1995 was less than the actual monetary growth rate. This can be explained by the introduction of the complex of measures aiming to stabilize the economic situation. Mainly due to the announced regime of a fixed exchange rate and the introduction of real positive interest rates it became possible to decrease the velocity of money and to curb inflation by the end of 1995, without a considerable fall in the monetary growth rate.

During the rest of the period Belarus remained on the upward-looking side of the Laffer curve. Despite the fact that in 1998, 1999 and 2000 the actual inflation rate exceeded the nominal money growth rate, both of them, nevertheless, remained lower than the revenue-maximizing money growth rate. However, an excess of the actual inflation rate over the actual nominal growth rate led to a decrease in real cash balances that was further aggravated by the restrictions introduced in foreign exchange markets in 1996. The phenomenon of Belarus remaining on the upward side of the Laffer curve during this period can be explained by the fact that the estimated revenue-maximizing money growth rate was itself very high. It, however, should not be referred to as a yardstick for achieving maximum seigniorage, because the costs of that will be high in the form of accelerating inflation[53]. Given a mechanism of administrative price controls in Belarus I assume that the difference between the true and official rates of inflation is significant. A measure of a true rate of inflation (if it were possible to calculate) should have raised a coefficient of the inflation rate, and therefore have reduced the value of revenue-maximizing money growth rate and respectively the values of seigniorage and IT. The fact that in 1995, the year of partial price liberalisation, the rate of actual money growth was in excess of the revenue-maximising one, and period-average inflation

[53] Also see Boichanka (2001) for similar conclusions.

exceeded the period-average rate of money growth provides some evidence supporting this argument.

In summary, the policy of inflationary financing of the economy had an overall negative effect, triggering an inflationary spiral, so reducing real money demand and pushing domestic money holders to switch from savings in banks to purchases of foreign assets or non-monetary assets.

This policy of monetary emission pursued by the Belarusian government during 1995-2002 aimed to support state-owned enterprises and in doing so, to avoid a sharp output contraction that occurred in many transition economies of Central and Eastern Europe in their early stages of transition, after the introduction of stabilisation packages. This was undertaken at the expense of the private sector and those households who were not the recipients of the state's subsidies. In this sense such a policy could not be regarded as equitable or efficient. The fact that by 2002 a decrease in money supply could be observed due to restrictions on the policy of monetary emission, with a consequent fall in the inflation rate, and the stabilisation of the Belarusian Rouble, can serve as evidence of the Belarusian authorities finally admitting the costs of excessive money issue.

Chapter 8 The Belarusian Economy at a Crossroads: A Conclusion

As noted in the earlier chapters, the beginning of the transition process from communism to a market economy in Belarus, as everywhere else in the region, was marked by a sharp decline in GDP and industrial production, and the huge price jump fuelled by price liberalisation. During 1991-95 the GDP was declining by 12 per cent per annum and the yearly inflation rates were far in excess of 1,000 percent.

Five years after the transition began, the Belarusian authorities, anticipating the social and consequently political costs of pursuing an IMF strategy primarily focused on macroeconomic stabilisation through monetary and fiscal contractionary policies and a policy of high interest rates, abandoned it and switched to the strategy of maintaining the economy at as close as possible to full employment through expansionary macroeconomic policy. Low interest rates and directed credits and preferential loans schemes, accompanied by foreign exchange and capital controls, which taken together can be termed financial repression, became its pillar. Reversing the privatisation programme was to prevent the Belarusian asset stripping and decline that was typical of Russia. Price controls and continual wage increases (not linked to labour productivity) were supposed to address the decrease in real incomes, and consequently prevent population impoverishment. Retaining and increasing state ownership in Belarusian enterprises, supplying them with credits and inactivating bankruptcy procedures helped to avoid the corporate distress that was typical of many CEE countries, in particular of Hungary. Excessive state control exerted on the banking sector made it serve the needs of the Belarusian authorities to maintain the Belarusian strategy of development.

Against the background of continuing transition recession and a range of currency and banking crises shaking the transition economies in the region, the revival of the Belarusian economy with economic growth averaging at 7 per cent per annum in 1996-02 created an impression that this alternative strategy had succeeded. Can the Belarusian alternative approach to transition claim to be successful? Based on our study can we conclude that the Belarusian financial policy has proven efficient? What can we learn from the Belarusian experience of financial repression?

The analysis undertaken in the present study revealed that the Belarusian financial policy of the late 1990s had proven inefficient and unable to target long-term

growth objectives. The policy of money-led stimulation of the economy triggered an inflationary spiral consequently leading to demonetisation and unofficial dollarisation of the economy. According to our findings a 1 per cent increase in the monthly inflation rate in Belarus during 1995-2002 on average led to a 7.8 per cent decrease in real money balances per month. Thus on average in 1996-2002 only 70 per cent of the economy was monetised. The policy of low interest rates discouraged savings, one of the main sources of financing enterprises in Belarus. The retained profits could not play a significant role in maintaining enterprises' economic activity in Belarus in the 1990s because 1) the number of loss-making enterprises tended to increase reaching 35 per cent of all enterprises in 2002, as against 7.3 per cent in 1994. Overall profits have tended to decrease - amounting to only 11.8 per cent of GDP in 2002 versus 52.9 per cent in 1994; 2) credit expansion and state subsidies to loss-making enterprises, combined with high taxation of profitable firms, also exhausted the financial resources of the healthier enterprises. Furthermore, borrowing from the foreign markets was restricted and a market for corporate securities did not exist due to the reversal of the privatisation programme. Therefore, economy financing remained mainly inflationary, as it was financed by the current and lagged emissions of the National Bank.

The policies of directed and preferential loans, high reserve requirements and a policy of low interest rates altogether led to financial disintermediation and the financial sector virtually playing no significant role in economic development. The former [financial disintermediation] was confirmed by the results of our empirical analysis (see chapter 6) showing that financial restraints imposed in Belarus had an overall negative effect on financial deepening. As the early chapters noted, as far as the latter is concerned the effect of financial development on economic growth materialises through two major channels: on the one hand capital accumulation (extensive growth), and on the other, technological change (intensive growth). Following the fact that financial repressionist policies resulted in financial disintermediation and demonetisation of the economy, the economic growth can hardly be attributed to capital accumulation. Paradoxically perhaps, the policy of macroeconomic expansion triggered liquidity contraction and consequently an increase in arrears and barter transactions. Therefore, we can speculate that financial development, if it mattered for economic growth in

Belarus in the long run[1], inhibited economic growth through the aforementioned repressionist policies.

Turning to the issue of the impact of financial development on economic growth through technological change, we can speculate that it did not materialise due to the following reasons.

First, the state subsidies and banks' loans were mainly designed to support poorly performing state-owned enterprises in agriculture and industry to keep them afloat. The government industrial policy was lacking 'strategic coherence and selectivity' and was unable to promote investment in specific sectors with strong growth potential and to 'spur structural change towards rapid modernisation of the economy' (Haiduk et al. 2004). The pattern of credit and subsidies allocation and a policy of low interest rates resulted in problems of adverse selection and moral hazard that were the opposite extreme to what was pronounced by the policy of high interest rates (see chapter 4). State-owned enterprises, adhering to the idea that they are too big for the state to let them sink, took bank loans for granted, often failing to repay them and waiting for new bank loans to bail them out. The investment did not go to support newly created private enterprises that were mainly serviced by non-system forming banks. In the risky and information-limited environment where the law often had a retroactive force and inactive bankruptcy procedures existed, the majority of the latter were reluctant to lend to the real sector, preferring to operate in the interbank loan or foreign exchange markets. Furthermore, as was outlined in chapter 5, the economic mechanism envisaged not only direct but implicit subsides to the state-owned enterprises in a form of tax exemption for some state-owned firms. This was at the expense of increasing the tax burden on the private sector, and granting access to cheap natural resources, which together led to crowding out of the private entrepreneur from the market.

Second, due to the highly inflationary environment, mainly short-term loans were granted to finance enterprises' working capital. The rate of capital depreciation fell from 6-8 per cent prior to 1991, to 1.5-2.4 per cent in 2002, suggesting that it would take 42-66 years instead of 12-16 years for full renewal of the fixed capital stock (Daneiko 2003, p.125). Overall capital depreciation reached 60 per cent in 2002 (ibid,

[1] Although the Granger-Causality test results (see chapter 6) suggest that finance did not matter for economic development in the period under analysis, no decisive conclusions can be drawn about the finance-growth relationship in the long run. The fact that long-run forcing tests performed as part of the ARDL procedure to cointegration (see chapter 6) reject the exogeneity of the real income series leaves some room for speculation about financial restraints having a negative effect on the economic growth in the long run.

p.125). Taken together this suggests that the average productivity of capital was expected to fall[2], due to the replacement of high-yielding investment that can be generated in the private sector or in the branches of the economy with high technological potential with low-return investment, directed mainly to loss-making agricultural and industrial sectors, the inefficient house construction sector, and to stimulate household consumption through wage increases. Therefore, neither lowering the cost of capital nor directed credits and preferential loans schemes provided to enterprises, the two core financial repressionist policies in Belarus in the late 1990s, could facilitate efficient capital allocation and consequently provide sustainability of economic growth in the long run. The slowdown in growth in 1999-2002, mounting size of inventories[3], increase in loss-making enterprises and significant deterioration of Belarus' competitive position[4] all provide evidence of the inefficiency of the Belarusian economic strategy. Unlike China (see chapter 5), Belarus has not attempted to create a competitive environment allowing for new entrants to the market and opening itself up for foreign direct investment. Neither has it used the opportunity of high growth to promote some gradual structural and institutional reforms.

In summary, the Belarusian experience of financial repression had an overall negative effect on financial development, resulting in shallow finance and financial intermediaries playing a passive role in the development process over the period of investigation. However, if finance had mattered in the long run, financial repression would have been expected to inhibit economic growth through decreasing the share of savings to be allocated to investment and lowering the average productivity of capital. Therefore, financial policy that Belarus pursued in 1996-2000 can be viewed as a 'survival-oriented strategy' rather than a 'growth-oriented strategy' (Bakanova et al. 2003) that, in the first place, aimed to serve the government's own needs in ensuring its political survival. Although since 2000, government policies have been gradually adjusted towards reducing economic distortions, in particular in the financial sector, and GDP growth surged again from 4.5 per cent in 2002 to 11 per cent in 2004, the

[2] Unfortunately, we cannot provide evidence supporting this conclusion due to the unavailability of the data on capital stock.

[3] As of 2002 inventories reached 65.3 per cent of current monthly output (Haiduk et al. 2004).

[4] Competitiveness is an important determinant of economic growth in a small open economy such as Belarus. Therefore, worsening of Belarus' competitive position, in particular relative to Russian producers (see footnote 5), can have detrimental effects for the Belarusian economy as a whole. The erosion of Belarus' competitive advantage can be explained by high wage growth attributed to nominal wage increases and real currency appreciation (see Haiduk et al. 2004, Zaiko 2005 and World Bank 2005).

sustainability of a new growth pattern, and therefore social stability remains questionable. This is due to the delay in economic restructuring and the vulnerability of the Belarusian economy to any change in external environment. Since 2001 the external environment has favoured Belarusian economic development, to a great extent explaining these high rates of economic growth[5]. If the government continues to avoid fundamental reforms when growth is high[6], it puts the country under the risk of a severe transition crisis that will inflict even greater economic and social costs than after the Soviet Union's collapse.

[5] In 2001-2004 Belarus benefited directly from the growth in oil prices - through the expansion of oil processing exports, and indirectly - through accelerated growth and demand in Russia, which still remains the Belarus' main trade partner (World Bank 2005).

[6] A high rate of growth allows for more smooth reforms. However, it is also true that when growth is high, the pressure for change is less.

Appendix A

Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Czech Republic	2	3	3	3	3	3	3	3	3+	3+	4-
Estonia	1	2	3	3	3	3	3+	3+	4-	4-	4-
Hungary	2	2	3	3	3	3	4	4	4	4	4
Latvia	1	2	2	3	3	3	3	2-	3	3	4-
Lithuania	1	1	2	2	3	3	3	3	3	3	3
Poland	2	2	3	3	3	3	3	3+	3+	3+	3+
Russia	1	1	1	2	2	2	2+	2	2-	2-	2
Ukraine	1	1	1	1	2	2	2	2	2	2	2+
Belarus	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**1**	**1**	**1**	**2-**
Turkmenistan	1	1	1	1	1	1	1	1	1	1	1
Uzbekistan	1	1	1	1	2	2	2-	2-	2-	2-	2

Table A.1 Index of banking reform (1991-2000)[1]

[1] The EBRD Transition Reports 2000, 2002. Index is a scale from 1 to 4+. 1 stands for little progress beyond establishment of two-tier system. 2 denotes significant liberalisation of interest rates and credit allocation. 3 stands for substantial progress in establishment of bank solvency and of framework for prudential supervision; full interest rate liberalisation with little preferential access to cheap financing; significant lending to private enterprises and significant presence of private banks; 4 – means significant movement of banking laws and regulations towards BIS standards, substantial financial deepening and significant term lending to private enterprises; 4+ stands for standards and performance norms of advanced industrial economies: full convergence of banking laws and regulations with Bank of International Settlements standards; provision of full set of competitive banking services.

Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Czech Republic	1	1	2	3-	3-	3-	3-	3	3	3	3
Estonia	1	1	2-	2-	2-	2	3	3	3	3	3+
Hungary	2	2	2	2	3	3	3+	3+	3+	4-	4-
Latvia	1	1	1	2	2	2	2+	2+	2+	2+	3
Lithuania	1	1	2-	2	2	2	2+	2+	2+	3	3
Poland	2	2	2	2	3	3	3+	3+	3+	4-	4-
Russia	1	1	2-	2-	2	3	3	2-	2-	2-	2+
Ukraine	1	2-	2-	2-	2	2	2	2	2	2	2
Belarus	1	2	2	2	2	2	2	2	2	2	**2**
Turkmenistan	1	1	1	1	1	1	1	1	1	1	1
Uzbekistan	1	1	1	2	2	2	2	2	2	2	2

Table A.2 Index of reforms of securities markets and non-bank financial institutions (1991-2000)[2]

[2] The EBRD Transition Reports 2000, 2002. Index is a scale from 1 to 4+. 1 stands for little progress; 2 stands for formation of securities exchanges, market-makers and brokers; some trading in government paper and/or securities; rudimentary legal and regulatory framework for the issuance and trading of securities; 3 denotes substantial issuance of securities by private enterprises; establishment of independent share registries, secure clearance and settlement procedures, and some protection of minority shareholders; emergence of non-bank financial institutions and associated regulatory framework; 4 means securities laws and regulations approaching IOSCO standards; substantial market liquidity and capitalization; well-functioning non-bank financial institutions and effective regulation; 4+ stands for standards and performance norms of advanced industrial economies: full convergence of securities norms and regulations with International Organization of Securities Commissions standards; fully developed non-bank intermediation.

Appendix B Chronology of Restrictions Imposed/Released in Selected Financial Markets[1] in Belarus from 1996-2000[2]

25 April 1996 The NBB banned issuing loans nominated in foreign currency by commercial banks to firms. It was also concerned interbank loans (NBB telegram No. 4-96).

8 January 1997 A corridor for BRB/1 USD was considered to be within 15,500-21,000 BRB/1 USD for the first quarter of 1997. The over-the-counter foreign exchange rate was not to exceed 1.05 of the official rate (Resolution of the Council of Ministers and NBB No. 12/1.

17 January 1997 The NBB temporarily banned convertibility of cash foreign currency through third currencies. Moreover, the foreign exchange rate for non-cash currency was said not to divert more than 3 per cent from the NBB official cross-exchange rates (NBB telegrams No.31005/205, No.31005/206).

31 January 1997 The NBB set the difference between bought and sold foreign currencies by commercial banks from/to individuals to be sold to the NBB (NBB telegram No.31001/2072 of January 31st 1997).

5 February 1997 Administrative and financial sanctions of 70 –300 minimum wages were introduced for carrying out foreign exchange transactions on the 'black market'. Furthermore, exchange offices of commercial banks were obliged to register the passport details of individuals buying foreign currency (Presidential Decree 'On some measures of securing the order of foreign exchange transactions', No.1).

17 February 1997 The National Bank set the foreign exchange rate of commercial banks not to exceed 1.5 per cent of the official rate plus 1 per cent of banks' commission (NBB telegram No.31005/553).

3 March 1997 The National Bank removed the restrictions on issuing loans nominated in foreign currency by commercial banks to firms (NBB telegram No.04013/70).

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[1] Here, mainly the developments in domestic market for foreign currency, securities and promissory notes markets and credit market are covered.

[2] National Bank of Belarus (Konsul'tant Plyus: Belarus [CD-Rom] 2002), TACIS various issues. Information on restraints imposed in currency market and in capital market in 1996 is very limited.

To analyse the productivity of seigniorage over 1995-2002 in Belarus, we calculate the maximum revenue that can be obtained if the steady-state conditions hold, and compare with actual revenue (see table 7.21). All the computations are provided in appendix G.

From the results presented in table 7.21 first of all one can see that the maximum rate of seigniorage was on average between 7-10 per cent during 1995-2002 that is in line with the results obtained by Cagan (1956), and by Romer and Larrain (1993). Their findings also suggest that the revenue-maximising money growth rate varies about 300 per cent per annum. This also supports our findings. Table 7.21 shows that throughout the period the actual rate of seigniorage does not exceed the steady-state one, although it is high enough to cover the budget deficit (see figure 7.6), and even partly cover quasi-fiscal operations accounting for 5-6 per cent of GDP in 1999-2000.

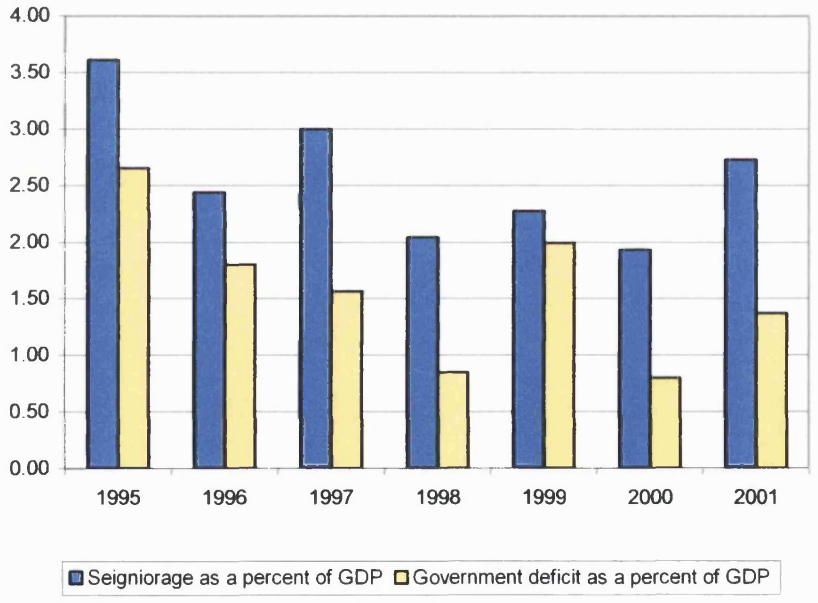

Figure 7.6: Seigniorage and budget deficit as a per cent of GDP[51]

[51] Seigniorage is based on author's calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. The data on budget deficit is derived from International Financial Statistics [online]. Available from: http://ifs.apdi.net/imf/logon.aspx [Accessed November 2003].

30 May 1997 Introduced the surrender requirements of 30 per cent for the foreign currency which commercial banks bought from individuals. (NBB Resolution No.904)

1 August 1997 According to NBB letter No.901 (29 June 1997), individuals were not allowed to take out of the country BRB cash exceeding 100 minimum wages (equivalent to USD 556) per person. Furthermore, bringing BRB cash into the country by individuals was totally banned. These measures were the first evidence of the growing currency crisis in Belarus.

4 September 1997 The NBB issued letter 'On order of non-residents investing into the government and NBB securities' (No.944), which came as a surprise. It appeared to be evidence of partial liberalisation of short-term capital inflows in the absence of current account convertibility (even with stronger exchange and cross-border payments controls than ever) and under conditions of an unstable macroeconomic situation, particularly when currency crisis was showing its teeth. According to the letter, non-residents were allowed to invest into government securities markets (both short-term and long-term) and NBB securities for BRB. The matter was that both remained in low demand from potential investors due to the reasons discussed in chapter 5.2

21 March 1998 Following the increasing gap between the official exchange rate of BRB and its quotation on the Moscow Interbank Stock Exchange (MISE), amounting to 76 per cent on 16 March 1998, the Belarusian authorities asked the Central Bank of Russia to stop the BRB trading on the MISE. This measure only increased speculative tensions and triggered a massive surge in BRB supply in stock exchanges in Ukraine and the Baltic countries, as well as in interbank and over the counter markets of Russia and further 25 per cent devaluation of BRB within the week. In response to this the Belarusian authorities terminated all payments in BRB between non-residents and payments in BRB for imported goods (TACIS 1998a). Furthermore, on 23 March the NBB terminated carrying out of non-cash transactions between residents of Belarus, excluding payments due to the NBB, the budget and the Fund of social defence (NBB telegram No.31-06/1450).

1 July 1998 The NBB temporarily prohibited buying and selling for BRB of foreign bills nominated in BRB (NBB telegram 'On order of buying and selling of foreign bills for BRB', No.31-06/172).

7 July 1998 The NBB suspended transferring of BRB from individuals' accounts to non-residents' accounts and transferring of BRB from non-residents' accounts to individuals' accounts, open in authorised bank (excluding transferring of wages, scholarships, pensions, allowances, alimonies, and means on courts' executive documents). Belarusian firms were also banned from paying back in BRB loans issued from non-residents and denominated in foreign currency (NBB telegram No.31-06/3437). This measure aimed to limit the BRB mobility to prevent any speculative attacks from foreign financial markets on the BRB stability.

14 August 1998 The NBB authorised that non-residents could not buy securities (including bills) which were nominated in foreign currency for BRB from Belarusian firms, and that Belarusian firms could not allocate Belarusian roubles to non-residents' accounts in any forms (loans, deposits and other financial instruments) (NBB telegram No.31-06/4199).

November 1998 The NBB authorised that transactions of more than 1,000 units of foreign exchange were to be carried out at the official rate and only at the Minsk Interbank Currency Exchange (MICE)[3] (was in force from 2 November 1998 to 26 January 1999) (TACIS 1998b).

28 November 1998 The NBB increased the mandatory surrender requirements from 30 per cent of 95 per cent for foreign currencies, which commercial banks buy from individuals (TACIS 1998b).

8 December 1999 The NBB introduced two exchange rates, namely official and special. While the former was used for carrying on transactions at the main trade session where compulsory surrender of foreign currency at the amount of 30 per cent was undertaken, the latter was used exclusively for accounting purposes. From 16 December 1998 the additional trade session, where the rest of foreign currencies' trading (including additional 10-per cent surrender of export earnings), was announced. This rate was 1.5 times higher than official exchange rate but still far overvalued compared to the market rate (NBB telegram No.31-06/6600).

10 January 1999 Easing up of the surrender requirements for foreign currency, which commercial banks bought from individuals. They were reduced from 95% to 30% (NBB Telegram No.31-06/7031 (23 December 1998)).

[3] MICE was transformed into BCSE in January 1999

February 1999 Removing of the restrictions on the sum of transactions with regard to the trading of foreign exchange at the interbank currency market. Moreover, the exchange rate for these transactions was allowed to be set on a basis of demand and supply (NBB Telegram No.31-06/492 (26 January 1999))

26 February 1999 Belarusian banks and firms were temporarily prohibited from purchasing foreign exchange outside the BCSE. The ban was not applied to transactions with a foreign company if the company placed the BRB equivalent in accounts registered as type "T" (for international trade transactions), "I" (for investment to the Belarusian economy), or "C" (for the investment into government securities and treasury bonds) in authorised banks of Belarus. This regulation did not also affect exchange transactions with individuals (NBB Telegram No.31-06/1268).

1 March 1999 The rate of the additional trade session at the BCSE was suspended and as a result official exchange rate was unified. It was to be set on the basis of trading results and to be used in accounting, taxation and reports. De-facto it remained well below 'black market' exchange rate. In September 1999 the additional trade session was renewed (see below) (NBB telegram No.31-06/1270 (26 February 1999).

2 June 1999 Currency market activities were strengthened further following the NBB Resolution 'On the order of submission of information by banks concerning currency operations', No.9.2, in which commercial banks were obliged to inform the NBB about advance payments to non-residents if the sum of the payment exceeded USD 100,000. Moreover, in some cases commercial banks were also required to submit information about the currency operations of their clients.

11 June 1999 The NBB set the exchange rate at which transactions with individuals were carried out, to exceed the official rate by no more than 3 per cent of the official rate. Moreover, restrictions on the sum of foreign currency able to be bought by each individual were imposed and were not supposed to exceed USD 200 per day (Letter 'On transaction with individuals', No 31-06/3765).

23 August 1999 The NBB authorised the Belarusian banks not to accept domestic currency from non-residents carrying out their activity on the territory of the Republic of Belarus, as well as payment documents and promissory notes denominated in BRB in payment against banks' liabilities denominated in foreign currency (NBB Resolution 'On regulation of some operations of banks', No.15.1g).

26 August 1999 The additional trade session at the Belarusian Currency-Stock Exchange was renewed with effect from 2 September 1999 (NBB Resolutions No15.10 and No15.11). According to NBB telegram 'On selling and buying of national currency', No 31-20/5757, firms were obliged to sell 30 per cent of their earnings in foreign currency at the main session at the official exchange rate and can sell their other foreign currency revenues at an exchange rate up to 1.5 times the official exchange rate at the additional session. All foreign exchange transactions on sums over 1,000 units per day per firm outside the BCSE were prohibited. The measures were believed to revive activity in the official currency market.

11 September 1999 The NBB temporarily banned the use of bills by economic agents, including non-residents carrying out their activity in Belarus, issued by the Belarusian banks in payments against foreign economic transactions. (NBB telegram No.36-05/474).

25 November 1999 Easing up of the regulations on foreign currency transactions (NBB Resolution No.25.11). According to the Resolution the NBB cancelled regulations requiring banks to sell to the NBB foreign currency bought from individuals. The NBB also annulled the regulations limiting exchange transactions to 1,000 foreign currency units outside the BCSE.

14 December 1999 Liberalisation of the cash foreign currency market occurred: commercial banks were allowed freely to set the exchange rate for transactions with individuals.

30 December 1999 The NBB annulled some documents restricting the usage of BRB in international transactions (NBB Letter No.31-06/8497). The following documents were terminated: Telegram No.31-06/172 (1 July 1998), Telegram No.31-06/4199 (14 August 1998) and Telegram No.31-06/3437 (7 July 1998) (see above on the content of documents).

16 February 2000 The NBB was ordered to issue NBB bills nominated in foreign currency amounting to USD 50 million to stimulate an increase in foreign currency reserves. According to this document 'firms were exempted from obligations to concede a declaration about volumes and sources of investments channelled for purchasing these bills', as well as they were granted the right to conduct transactions with the purchase bills on the secondary market (Presidential Decree 'On the NBB bills nominated in foreign currency', No.63). The NBB issued also bonds nominated in foreign currency for individuals. The latter were exempted from declaring sources for

purchasing bonds and from paying income tax on revenues earned on operations with them.

24 February 2000 All payments in BRB from accounts of non-residents of the Republic of Belarus (excluding non-resident banks), open in the authorised Belarusian banks, into correspondent accounts of non-resident banks were banned (NBB Resolution 'On order of carrying out payments in BRB' No.6.12).

1 March 2000 For direction of foreign exchange to the state oil company "Belneftekhim" for purchasing oil additional 10 per cent-surrender requirement was introduced for the period of 1 March 2000 – 30 April 2000. Prior to this, the authorities had already introduced such an 'oil tax' for the period from 11 October 1999 to 1 January 2000 (TACIS 2000b).

25 April 2000 The NBB announced that maximum amount of deposits allocated by each individual in commercial banks due to be reimbursed at the expense of the Guarantee Fund was to be reduced from USD 2000 to USD 1000 (NBB Resolution No.9.8). However, there were 7 banks (all categorised as system-forming) where deposits of individuals were fully guaranteed by the state. This Resolution made them more attractive for individuals. Therefore, the NBB attempted to concentrate greater savings nominated in foreign currency in the 'core' banks for the latter to be able to serve the needs of real sector.

18 May 2000 The NBB amended the order on conduct of operations with foreign currency in Belarus, according to which accounts registered as type "T" (for international trade transactions) could be open only for representative offices and branch offices of non-residents registered on the territory of Belarus (NBB Resolution No.11.4).

1 June 2000 Due to the inability of the NBB to fully satisfy all the demands for foreign exchange, the NBB orally prohibited commercial banks from purchasing foreign exchange for their own needs at the additional session of BCSE. Banks were only permitted to buy foreign exchange upon the request of their clients.

1 September 2000 Authorised banks were banned to transfer money to non-residents' accounts registered as type "T" excluding those, specified in NBB Resolution No.11.4 of 18 May 2000 (see above).

13 October 2000 IMF concluded the Article IV consultation with Belarus (IMF 2000 (October).

Appendix C Chronology of Interest Rates Controls and Changes in the Level of the Refinancing Rate

Date of introduction	Restraint/level of the rate	Source[1]
1. Margin controls		
From 1 March to 26 April 1995	No more than 1 per cent p.m. on interbank loans	NBB Protocol No.5 (20 February 1995)
From 21 April to 20 May 1995	No more than 3 per cent p.m. on loans denominated in BRB and issued by commercial banks to economy	NBB letter No.21-95 (20 April 20 1995)
From 6 December 1996	Margin control dropped from 5 to 3 per cent p.m.	NBB letter No.02014/1157 (3 December 1996)
From 21 March 1997	Margin control of 3 per cent was cancelled	NBB letter No.04012/112 (21 March 1997)
2. Deposit Floor		
From 20 December 1994	20/32 per cent - on demand/time rouble deposits of legal entities	NBB telegram No.43-94 (12 December 1994)
From 21 February to April 20 1995	10/25 per cent p.m. – on demand/time rouble deposits of individuals	NBB telegram No.13-95 (17 March 1995)
From 21 April to 20 May 1995	20 per cent p.m. – on time rouble deposits of individuals and legal entities; 8 per cent p.m. – on demand rouble deposits of individuals	NBB letter No.21-95 (20 April 1995)
From 21 June 1995	10 per cent p.m. – on rouble time deposits of individuals and legal	NBB letter No.35-95 (19 June 1995)

[1] National Bank of Belarus (Konsul'tant Plyus: Belarus [CD-Rom] 2002).

	entities; 3 per cent p.m. – on rouble emand deposits of individuals	
From 21 July 1995	7 per cent p.m. – on rouble time deposits of individuals; 3 per cent p.m. – on rouble demand deposits of individuals	NBB letter No.37-95 (19 July 1995)
From 2 June 1997	4 per cent p.m. – on rouble time deposits of individuals; 1 per cent p.m. – on FX time deposits of individuals	NBB Telegram No.02012/285 (18 August 1997)
From 20 August 1997	38-45 per cent p.a. – on rouble time deposits of individuals on maturity	NBB telegram No.02012/285 (18 August 1997)
From 7 May 1998	Minimum deposit rate is cancelled	NBB telegram No.02-19/218 (6 May 1998)
3. Lombard/Overnight interest rate ceilings		
From September 1997	40 per cent p.a. (under 14 days) and 45 per cent p.a. (15-30 days) - on Lombard loans	NBB telegram No.02012/298 (29 August 1997)
From October 1997	38 per cent p.a. (under 14 days) and 42 per cent p.a. (15-30 days) - on Lombard loans	NBB telegram No.02012/333 (29 September 1997)
From December 1997	42 per cent p.a. (under 14 days) and 46 per cent p.a. (15-30 days) - on Lombard loans	NBB telegram No.02012/446 (28 November 1997)
From 16 January 1998	50 per cent p.a. (under 14 days) and 54 per cent p.a. (15-30 days) - on Lombard loans	NBB telegram No.02-19/17 (16 January 1998)
From 24 February 1998	55 per cent p.a. (under 14 days) and 60 per cent p.a. (15-30 days) - on Lombard loans	NBB telegram No.02-19/78 (24 February 1998)
From 8 April 1998	50 per cent p.a. (under 14 days) and	NBB telegram

	55 per cent p.a. (15-30 days) - on Lombard loans	No.02-19/162 (8 April 1998)
From 1 August 1998	42 per cent p.a. (under 14 days) and 46 per cent p.a. (15-30 days) - on Lombard loans	NBB telegram No.02-19/378 (30 July 1998)
From 1 December 1998	52 per cent p.a. (under 14 days) and 54 per cent p.a. (15-30 days) - on Lombard loans	NBB telegram No.02-19/639 (27 November 1998)
From 20 January 1999	64 per cent p.a. (under 14 days) and 66 per cent p.a. (15-30 days) - on Lombard loans	NBB telegram No.02-23/30 (19 January 1999)
From 2 March 1999	90 per cent p.a. (under 14 days) and 94 per cent p.a. (15-30 days) - on Lombard loans	NBB Resolution No.8/112 (26 February 1999)
From 1 April 1999	150 per cent p.a. (under 14 days) and 160 per cent p.a. (15-30 days) - on Lombard loans	NBB telegram No.5-14 (31 March 1999)
From 10 June 1999	120 per cent p.a. (under 14 days) and 125 per cent p.a. (15-30 days) - on Lombard loans	NBB Resolution No.8-2 (28 May 1999)
From 7 February 2000	180 per cent p.a. (under 14 days) and 190 per cent p.a. (15-30 days) - on Lombard loans	NBB Resolution No.5.1 (2 February 2000)
From 25 April 2000	160 per cent p.a. (under 14 days) and 170 per cent p.a. (15-30 days) - on Lombard loans	NBB Resolution No.14.2 (21 April 2000)
From 31 October 2000	170 per cent p.a. (under 14 days) and 180 per cent p.a. (15-30 days) - on Lombard loans 110 per cent p.a. – on overnight loans	NBB Resolution No.8/4332 (31 October 2000)
From 16 March 2001	160 per cent p.a. (under 14 days) and 170 per cent p.a. (15-30 days) - on	NBB Resolution No.8/5313

	Lombard loans	(16 March 2001)
From 13 April 2001	165 per cent p.a. (under 14 days) and 175 per cent p.a. (15-30 days) - on Lombard loans	NBB Resolution No.112 (13 April 2001)
From 25 May 2001	155 per cent p.a. (under 14 days) and 165 per cent p.a. (15-30 days) - on Lombard loans 105 per cent p.a. – on overnight loans	NBB Resolution No.156 (25 May 2001)
From 10 June 2001	130 per cent p.a. (under 14 days) and 140 per cent p.a. (15-30 days) - on Lombard loans	NBB Resolution No.204 (10 June 2001)
From 11 September 2001	110 per cent p.a. (under 14 days) and 120 per cent p.a. (15-30 days) - on Lombard loans 95 per cent p.a. – on overnight loans	NBB Resolution No.367 (27 December 2001)
4. Refinancing rate		
From 20 December 1994	40 per cent p.a.	NBB
From 21 April to 20 June 1995	25 per cent p.a.	
From 21 June 1995	8 per cent p.a.	
From 25 February 1997	42 per cent p.a.	
From 20 August 1997	38 per cent p.a.	
From 20 September 1997	36 per cent p.a.	
From 1 December 1997	40 per cent p.a.	
From 19 February 1998	50 per cent p.a.	
From 1 April 1998	44 per cent p.a.	
From 7 May 1998	40 per cent p.a.	

From 1 August 1998	38 per cent p.a.	
From 1 December 1998	48 per cent p.a.	
From 20 January 1999	60 per cent p.a.	
From 3 March 1999	82 per cent p.a.	
From 1 April 1999	90 per cent p.a.	
From 25 November 1999	110 per cent p.a.	
From 14 December, 1999	120 per cent p.a.	
From 10 January 2000	130 per cent p.a.	
From 25 January 2000	150 per cent p.a.	
From February 21st, 2000	175 per cent p.a.	
From 15 March 2000	150 per cent p.a.	
From 28 March 2000	130 per cent p.a.	
From 20 April 2000	110 per cent p.a.	
From 22 May 2000	100 per cent p.a.	
From 22 June 2000	90 per cent p.a.	
From 14 September 2000	85 per cent p.a.	
From 1 December 2000	80 per cent p.a.	
From 21 February 2001	75 per cent p.a.	
From 21 March 2001	70 per cent p.a.	
From 21 April 2001	68 per cent p.a.	
From 21 May 2001	64 per cent p.a.	
From 4 June 2001	60 per cent p.a.	
From 21 June 2001	55 per cent p.a.	

From 9 July 2001	50 per cent p.a.	
From 21 September 2001	48 per cent p.a.	
From 15 January 2001	66 per cent p.a.	

Appendix D

α_0 (intercept)	α_1 (trend)	β_1 (LNYsa)	δ_1 (FRI_1)	ϕ_1 (R)	μ_1 (DEV)	γ_1 (DU98)	Adj. GR sq.	Sargan's $\chi^2(1)$ statistic	Diagnostic tests
-14.56 (3.35)	-.0092 (.002)	.503 (0.26)	-.0011 (.0003)	-.002 (.0003)	-.0023 (.002)	-.127 (.05)	.69	.499	Serial Correlation: $\chi^2(12)$= 14.6 [.265]
P-value [.000]	P-value [.000]	P-value [.056]	P-value [.003]	P-value [0.002]	P-value [.179]	P-value [.013]		P-value [.480]	Functional Form: $\chi^2(1)$= 1.46 [.228] Normality: $\chi^2(1)$= 1.95 [.377] Heteroscedasticity: $\chi^2(1)$= .397[.529]

Table D.1: Summary of the results of estimating model (6.11) with FRI_1 by Two-Stage Least Squares methodology[1]

[1] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NB during our meeting in March 2003; Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2005]. Standard errors are in round parentheses.

α_0 **(intercept)**	α_1 **(trend)**	β_1 **(LNYsa)**	δ_1 **(FRI_2)**	ϕ_1 **(R)**	μ_1 **(DEV)**	γ_1 **(DU98)**	**Adj. GR sq.**	**Sargan's $\chi^2(1)$ statistic**	**Diagnostic tests**
-6.9 (2.19)	-.004 (.002)	.383 (0.25)	-.0005 (.0003)	-.002 (.0008)	-.005 (.002)	-.076 (.05)	.65	.148	Serial Correlation: $\chi^2(12)$= 22.7 [.03] Functional Form: $\chi^2(1)$= 2.56 [.110] Normality: $\chi^2(1)$= .04 [.978] Heteroscedasticity: $\chi^2(1)$= .217[.642]
P-value [.003]	P-value [.009]	P-value [.130]	P-value [.047]	P-value [0.002]	P-value [.005]	P-value [.138]		P-value [.701]	

Table D.2 Summary of the results of estimating model (6.11) with FRI_2 by Two-Stage Least Squares methodology[2]

[2] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (Janua 2002, 2003); the NBB data given to the author by the Head of Foreign Exchange Analysis and Forecasting Division of the NB during our meeting in M Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2005]. Standard errors ar parentheses.

Appendix E Testing for the Presence of a Unit Root in Series

In the present work the following tests were performed to test for stationarity: Augmented Dickey-Fuller (1979), Perron (1989), Banerjee et al (1992) and Zivot and Andrews (1992). The last three are unit root tests that allow for a structural change in the series.

The series is said to be stationary if it tends to return to its mean and fluctuate around it within a relatively constant range (see Gujarati 1998).

While performing Augmented Dickey-Fuller's (ADF) test[1] the following three equations can be used to test for the presence of a unit root in series (see Enders 1995):

$$\Delta y_t = \gamma y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta y_{t-i+1} + \mathrm{u}_t \tag{E.1}$$

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta y_{t-i+1} + \mathrm{u}_t \tag{E.2}$$

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta y_{t-i+1} + \alpha_1 t + \mathrm{u}_t \tag{E.3}$$

All three regressions differ from each other only by the presence/absence of deterministic elements, namely an intercept (drift term) and a linear time trend. If the series does not exhibit any trend and has a nonzero mean, only a constant should be included in the regression (see regression (E.2)), while if the series seems to be fluctuating around a zero mean, neither a constant nor a trend should be included in the regression. In this case the regression is a pure random walk model (E.1).

The null hypothesis states that the series contains a unit root ($\gamma = 0$). If the computed absolute value of the τ (tau) statistic exceeds the ADF absolute critical value, then we can reject the null hypothesis that the given time series contains a unit root or in other words that is nonstationary. Dickey and Fuller computed critical values for each of three regressions depending on whether deterministic terms are included in the regression. The critical values tend to increase with adding deterministic terms into the regression. Correspondingly, τ (random walk regression), τ_μ (with an intercept term included in the regression), τ_τ (with an intercept and a trend included in the regression) statistics should be used to test the null hypothesis of a unit root. Along with a set of

[1] Dickey-Fuller test is used when the series is AR(1) process, while Augmented Dickey-Fuller is used when the series is correlated at higher order lags.

tau-statistics Dickey and Fuller used three additional F-statistics ($\varphi_1, \varphi_2, \varphi_3$) to test joint hypothesis on the coefficients. To test the null hypothesis $\alpha_0 = \gamma = 0$ regression (E.2) should be estimated and φ_1 statistic should be used. If φ_1 is greater than the critical value provided by Dickey and Fuller than the null hypothesis can be rejected, that means that one or more of these parameters are not equal to 0. In the same way while estimating regression (E.3) the null hypothesis $\alpha_0 = \gamma = \alpha_1 = 0$ is tested using φ_2 statistic and the null hypothesis $\gamma = \alpha_1 = 0$ is tested using φ_3 statistic. In turn, all three statistics $\varphi_1, \varphi_2, \varphi_3$ are computed in the same way as an ordinary F statistic, that is:

$$\varphi_i = \frac{\left[\dfrac{RSSrestricted - RSSunrestricted}{r}\right]}{\left[\dfrac{RSSunrestricted}{(T-k)}\right]}, \qquad \text{(E.4)}$$

where RSS restricted and RSS unrestricted are correspondingly the sums of the squared residuals in restricted and unrestricted models

r is the number of restrictions

T is the number of usable observations

k is the number of parameters estimated in the unrestricted model

Along with τ and φ statistics it is also possible to check the significance of the intercept and time trend comparing computed tau-statistics, namely $\tau_{\alpha\tau}$, $\tau_{\beta\tau}$ and $\tau_{\alpha\mu}$, for the correspondent null hypotheses $\alpha_0 = 0 \,\text{given}\, \gamma = 0$, $\alpha_1 = 0 \,\text{given}\, \gamma = 0$ and $\alpha_0 = 0 \,\text{given}\, \gamma = 0$ with the critical values provided by Dickey and Fuller. All test statistics used in performing ADF test are summarised in table E.1.

Model	Hypothesis	Test St.	Critical Values for 95 per cent and 99 per cent confidence intervals*
$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta y_{t-i+1} + \alpha_1 t + u_t$ (E.3)	$\gamma = 0$	τ_τ	-3.45 and –4.04
	$\alpha_0 = 0$ given $\gamma = 0$	$\tau_{\alpha\tau}$	3.11 and 3.78
	$\alpha_1 = 0$ given $\gamma = 0$	$\tau_{\beta\tau}$	2.79 and 3.53
	$\gamma = \alpha_1 = 0$	φ_3	6.49 and 8.73
	$\alpha_0 = \gamma = \alpha_1 = 0$	φ_2	4.88 and 6.5
$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta y_{t-i+1} + u_t$ (E.2)	$\gamma = 0$	τ_μ	-2.89 and –3.51
	$\alpha_0 = 0$ given $\gamma = 0$	$\tau_{\alpha\mu}$	2.54 and 3.22
	$\alpha_0 = \gamma = 0$	φ_1	4.71 and 6.70
$\Delta y_t = \gamma y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta y_{t-i+1} + u_t$ (E.1)	$\gamma = 0$	τ	-1.95 and –2.60

Table E.1: Summary of the Dickey-Fuller tests[2]

Thus, a general ADF procedure involves computation of all test statistics mentioned above, starting from testing the null hypothesis that the data are generated by (E.1) against the alternative one that the data are generated by (E.2), then testing the null hypothesis that the data is generated by (E.3) versus (E.1), and finally by (E.2) versus (E.3).

Perron (1989) considers three different models under the null hypothesis: the first is the 'crash' model which allows for a change in the level of the series (E.5); the second allows for a change in the rate of growth (E.6); and the third permits both a change in the level and a change in the slope of the deterministic trend (E.7).

$$y_t = \mu + y_{t-1} + D(TB)_t + e_t, \quad \text{(E.5)}$$

$$y_t = \mu_1 + y_{t-1} + (\mu_2 - \mu_1)DU_t + e_t, \quad \text{(E.6)}$$

$$y_t = \mu_1 + y_{t-1} + D(TB)_t + (\mu_2 - \mu_1)DU_t + e_t, \quad \text{(E.7)}$$

where $D(TB)_t$=1 if t=T_B+ 1, 0 otherwise;

[2] The table is adapted from Enders (1995). Asterisk denotes critical values for a sample size of 100.

DU_t=1 if t > T_B, 0 otherwise;

μ is the drift parameter and β is the linear time trend;

T_B denotes the time of break

The alternative models take the following form:

$$y_t = \mu_1 + \beta t + (\mu_2 - \mu_1)DU_t + e_t \quad \text{(E.5)*}$$

$$y_t = \mu + \beta_1 t + (\beta_2 - \beta_1)DT_t + e_t, \quad \text{(E.6)*}$$

$$y_t = \mu_1 + \beta_1 t + (\mu_2 - \mu_1)DU_t + (\beta_2 - \beta_1)DT_t + e_t \quad , \quad \text{(E.7)*}$$

where DT_t=t - T_B, and DT_t=t if t> T_B and 0 otherwise.

The null hypothesis of a unit root in model (E.5) is characterised by a dummy variable which takes the value one at the time of the break. Under the alternative hypothesis of a 'trend-stationary' system model (E.5)* allows for a one-time change in the intercept of the trend function. Under the null hypothesis model (E.6) specifies that the drift parameter changes from μ_1 to μ_2 at the time of the break, whereas under the alternative hypothesis (E.6)* a change in the slope of the trend function at the time of the break is allowed. Finally, model (E.7) allows for both effects to take place simultaneously (see Perron 1989, p.1364).

Unlike Perron, Banerjee et al. (1992) treat the break date as unknown a priori. Their methodology is based on estimating the following regression

$$\Delta y_t = \alpha_0 + \alpha_1 t + \alpha_2 y_{t-1} + \sum_i^k \alpha_3 \Delta y_{t-i} + u_t \quad \text{(E.8)}$$

The set of ADF t statistics (recursive, rolling and sequential statistics) is computed on the following basis.

The recursive minimum ADF t statistic is computed using sub-samples t=1,...,k, for k=k_0,...,T, where k_0 is a start-up values and T is the size of the full sample. Each following sub-sample increases by one observation until eventually the full sample is covered. The above model is estimated for each sub-sample and then the minimum value of τ statistic is chosen and compared to the critical values originated by Banerjee et al. (1992). The computation of rolling statistics is done in a similar way with a difference that sub-samples are a constant fraction of the full sample (T). Banerjee et al. (1992) use k equal to one-third of the sample size, namely 0.3T. Thus, the first sub-sample covers 1 to k. The second starts from 2 and finishes at k+1 and so on. For the computation of a sequential t statistic a dummy variable that assigns the shift either in trend or in mean model is introduced into regression (E.8). The estimated regressions

are similar to model (E.5) and model (E.6) of Perron (1989) under the null hypothesis of a unit root. The break point is to be found between 0.15 and (T- 0.15T), given 0.15 is a trimming value according to Banerjee et al. The lowest t statistic across all sub-samples is chosen and compared to the critical values provided in Banerjee et al. (1992). Along with the t statistic the F statistic is calculated to test the null hypothesis of a joint significance of the coefficient of the introduced dummy variable and α_2 (see (E.8)). The largest value of the F statistic is then compared with Banerjee's et al. critical value (for more details see Banerjee et al. 1992, Harris 1995).

The Zivot-Andrews procedure involves estimating the same three regressions proposed by Perron (1989). In comparison with Perron's (1989) findings, Zivot and Andrews (1992, p. 251) provide less evidence against the unit-root hypothesis while reanalysing the data series considered by Perron (1989). Unlike Perron, Zivot and Andrews do not take the break fraction to be exogenous, but treat the structural break as endogenous. The t-min statistics are calculated in a fashion similar to Banerjee's et al. sequential statistics with a break fraction defined as $X=T_B/T$, ranging from $j=2/T$ to $j=(T-1)/T$. The break year is the year corresponding to the minimum statistic. For more descriptions of the test see Zivot and Andrews (1992).

Appendix F Checking the Reliability of the Monthly GDP Series Compiled by the Ministry of Statistics and Analysis of Belarus[1]

The monthly GDP series, used in the present work, is provided by the Ministry of Statistics and Analysis (MSA) of Belarus. The data are compiled according to the System of National Accounts implemented in 1993. The aggregate GDP data is collected from the production accounts that leads to some statistical discrepancy between the aggregate GDP and its value obtained from expenditure flows.

It is not common for any economies around the world to produce GDP series on a monthly basis, since it involves a laborious compiling process. Belarus might be the only country that produces GDP on a monthly basis. That is why it is reasonable to check how reliable is the official monthly GDP data. Here, we intend to check the reliability of the monthly GDP data due to the Belarusian official statistics by comparing the quarterly GDP data derived by summation of the monthly GDP compiled by the MSA and those published in the International Financial Statistics (IFS) by the International Monetary Fund (IMF). The data published in the latter source are regarded as a worldwide yardstick.

The further analysis is two-fold.

First of all, there is need to look at correlation matrix of real GDP published by the IMF and real GDP compiled by the Ministry of Statistics and Analysis.

The following variables are used in the present analysis:

1. GDPRimf – the quarterly Gross Domestic Product Volume (IMF) in prices of 1995, chained, millions of BRB[2].

2. GDPRmsa – the reconstructed quarterly Gross Domestic Product Volume (MSA) in prices of 1995, chained, millions of BRB[3].

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[1] I am indebted to Sergei Perapechka, an MA Student in Economics (2002-2003), University of Sussex, who shared his ideas about checking the reliability of the monthly GDP series with me. Although, the principles used in the present analysis are the same, the obtained results are relatively different from those obtained by Perapechka, S. that can be explained by the different samples used in both analyses and due to some discrepancies in the GDP data of the official statistics.

[2] International Financial Statistics [online]. Available from: http://ifs.apdi.net/imf/logon.aspx [Accessed November 2003]; line 99b.p in the IFS.

[3] Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003].

The previous conclusion is also supported by the results of simple regression analyses summarised in table F.2.1 and by the Wald Test results (see table F.2.2).

The estimated coefficients	
intercept	**GDPRmsa**
-409.13 (-.76) P-value [.458]	1.01 (67.38) P-value [.000]

Table F.2.1: Summary of the estimated regression of GDPRimf on GDPRmsa[6]

Hypothesis tested	Chi (χ^2) statistic
A1=0	$\chi^2(1)$= .56991[.450]
A2=1	$\chi^2(1)$= .49250[.483]
A1=0 U A2=1	$\chi^2(2)$= .67136[.715]

Table F.2.2: Summary of the Wald test results[7]

As one can see from tables F.2.1 and F2.2 the estimated coefficient of GDPRmsa is statistically not different from 1. Although the diagnostic tests show the presence of serial correlation in residuals, it is not surprising in this case because both variables, on the one hand GDPRimf, and on the other GDPRmsa are highly autocorrelated. The null hypotheses of A2=1 is supported by the results of the Wald test. The results of the latter also show that constant in both regressions is statistically not different from 0 and the null hypothesis under the both restrictions imposed is also accepted.

Following these results one can conclude that the quarterly GDP series obtained by summation of the monthly GDP data released by the Ministry of Statistics and Analysis is not statistically different from those published by the IMF. It implies that the official monthly GDP series is reliable and can be used in the present study.

[6] Authors' calculations on the data obtained from the International Financial Statistics [online]. Available from: http://ifs.apdi.net/imf/logon.aspx [Accessed November 2003] and the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. T-statistics are in parentheses

[7] Ibid. Regression estimated: GDPRimf = A1 + A2GDPRmsa; p-values are in square brackets.

Appendix G The Methodology of Deriving the Maximum and Actual Rates of Seigniorage and Inflation Tax in Belarus in 1995-2002

Deriving the Actual Revenue from Seigniorage and Inflation Tax

First of all there is need to distinguish between seigniorage computed as the end-of-period and as a period average.

The revenue from seigniorage based on the end-of-period data (see table G.1) was computed as a change in the absolute value of monetary base (MB) at the end of the period divided by the price index at the end of the period and divided by the real GDP in this period of time (see formula (7.1) in chapter 7). For example, the revenue from seigniorage as a per cent of GDP in 1995 was computed in the following way:

$$S=[(MB_{December1995} - MB_{December1994})/CPI_{December1995}] / \text{Real GDP}_{1995} * 100 \qquad (G.1)$$

The value of inflation tax was obtained from formula (7.3):

$$\frac{M}{P}\left(\frac{\partial P}{\partial t}\frac{1}{P}\right) = \frac{\partial M}{\partial t}\frac{1}{P} - \frac{\partial\left(\frac{M}{P}\right)}{\partial t},$$

where IT is equal to the difference between seigniorage and change in real cash balances. From the above formula one can see that the revenue from inflation tax is inclusive into the revenue from seigniorage. Inflation tax is greater than seigniorage when real cash balances decrease[1].

The revenue from seigniorage based on the period average data (see table G.1) was computed in a similar way as the revenue from seigniorage based on the end-of-period data with the only difference that for the computation of the former there were used the period average values of nominal monetary base and inflation rate. In turn the period average value of nominal monetary base and CPI are computed as arithmetic averages. For example, for 1995 the nominal value of monetary base is equal to $(MB_{December1995} + MB_{December1994})/ 2$, while the consumer price index is equal to the sum of all monthly price indices in 1995 divided by 12.

[1] It is also possible to check the reliability of the result based on formula (G.2) by computing inflation tax in a different way, namely by multiplying the inflation rate by the value of real money balances.

Year	MB, end of period, mln. of BRB	MB, period average, mln. of BRB	CPI Jan 1997=1, end of period	MB real, end of period, mln. of BRB	CPI Jan 1997=1, period average	MB real, period average, mln. of BRB	GDP Real, mln. of BRB	Seigniorage, as a % of GDP		Inflation Tax, as a % of GDP	
								end of period	period aver.	end of period	period aver.
1994	1417.3	-	0.184	7689.55	-	-	-		-		-
1995	6483.1	3950.2	0.634	10219.66	0.4949	7981.1	221166	3.61	-	2.47	-
1996	11372.5	8927.8	0.883	12885.04	0.7556	11816.09	227358.7	2.44	2.9	1.26	1.21
1997	22336.6	16855	1.442	15486.12	1.238	13611.37	253277.5	3.00	2.53	1.97	1.82
1998	45151.3	33744	4.064	11110.9	2.145	15733.66	274552.9	2.04	2.87	3.63	2.1
1999	137281.6	91983	14.276	9616.4	8.45	10890.84	283887.6	2.27	2.43	2.8	4.13
2000	309205.7	223244	29.689	10414.9	22.71	9829.595	300353.1	1.93	1.92	1.66	2.27
2001	680305.0	513684	43.449	15657.48	36.65	14014.93	312367.3	2.73	2.54	1.06	1.2
2002	953278.0	816792	58.6	16267.42	52.33	15609.57	326967.7	1.42	1.77	1.24	1.28

Table G.1: The actual revenue from seigniorage and inflation tax in Belarus in 1995-2002[2]

[2] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003]. Although all the computations are based on monthly data, here we present the summary of the annual results to save some space. The monthly-based calculations can be supplied on request.

Deriving the Maximum Revenue from Seigniorage

By setting the monetary base in December 1994 as a departing value the computations of the monetary base in the following years are done by multiplying the value of the monetary base at the beginning of each period by the steady-state monetary growth rate that is in our case the revenue-maximizing monetary growth rate. For example, to calculate an absolute value of the monetary base in December 1995 (stock of MB at the end of the year), one should multiply 1417.4 (a departing value) by 4.2388 (323.88/100+1) to get BRB 6008 million. All the calculations are based on monthly dataset.

Price index was calculated in a similar way by increasing it by 1.1279 each following month and referring to January 1997=100 as a base value.

Finally, the maximum revenue from seigniorage was computed in the same way as the actual revenue from seigniorage (see table G.2 for the computations performed).

There is no need to compute the maximum revenue from inflation tax because under steady-state conditions the revenue from seigniorage is equal to one from inflation tax leaving real money balances unchanged.

Year	MB, mln. of BRB	CPI January 1997=1, end of period	GDP real, mln. of BRB	Seigniorage, as a % of GDP
1994	1417.3	0.049	-	-
1995	6007.7	0.209	221166	9.92
1996	25465.7	0.887	227358.7	9.65
1997	107945.2	3.758	253277.5	8.67
1998	457562.5	15.93	274552.9	7.99
1999	1939534.8	67.53	283887.6	7.73
2000	8221380.5	286.23	300353.1	7.31
2001	34849127	1213.29	312367.3	7.03
2002	147719921	5142.95	326967.7	6.71

Table G.2: The maximum revenue from seigniorage in Belarus in 1995-2002[3]

[3] Authors' calculations on the data provided by the National Bank of the Republic of Belarus (National Bank of Belarus 2000a (January), 2000b (January), 2001, 2002, 2003); Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003].

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Second, we regress GDPRimf on GDPRmsa to check whether the GDPRmsa coefficients are statistically not different from 1 and the constant of the regression is close to zero. If it holds it will argue for the reliability of the monthly GDP series produced by the MSA.

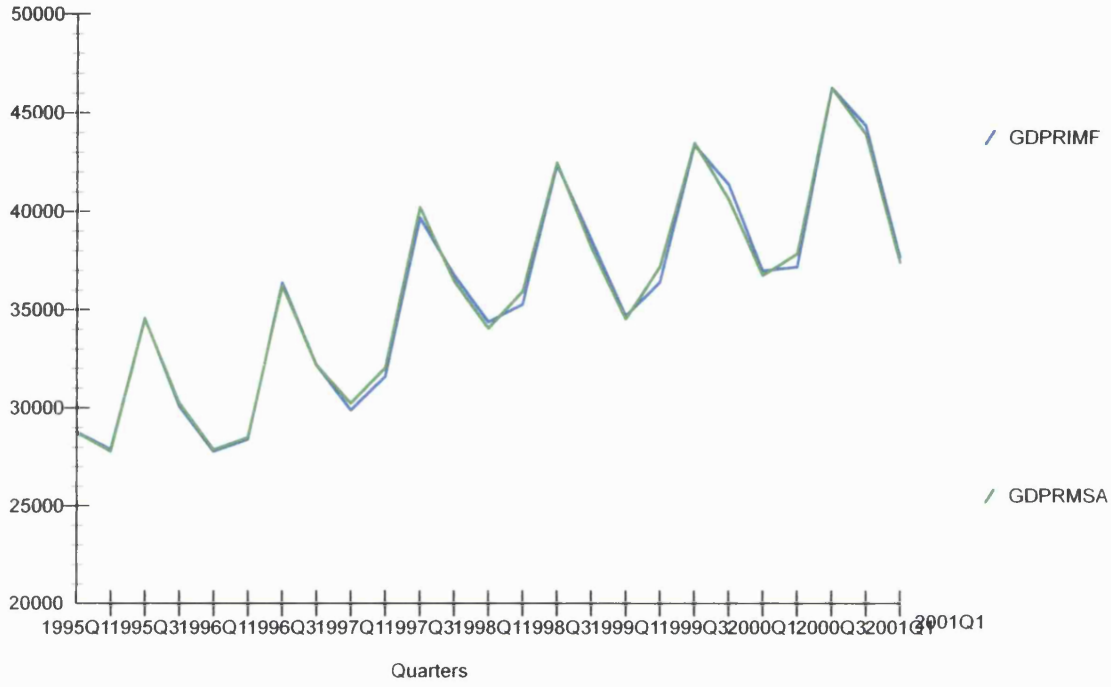

Figure F.1: The quarterly real GDP by IMF and by MSA compared, 1995Q1-2001Q1[4]

The graphic examination of figure F.1 shows that the real GDP variables by IMF and MSA have very similar trends.

Table F.1 contains correlation coefficients of the variables of interest. One can see that GDPRimf and GDPRmsa are highly correlated implying their close identity.

	GDPRIMF	**GDPRMSA**
GDPRIMF	1.0000	.99748
GDPRMSA	.99748	1.0000

Table F.1: Estimated correlation matrix of variables[5]

[4] Authors' calculations on the data obtained from the International Financial Statistics [online]. Available from: http://ifs.apdi.net/imf/logon.aspx [Accessed November 2003] and the Institute of Privatisation and Management [online]. Available from: http://ipm.by/index.pl?topicid=inside [Accessed September 2003].
[5] Ibid.

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